

THE MARINE REVIEW

VOL. XXXIV.

CLEVELAND, JULY 26, 1906.

No. 4.

THE PORT OF SAN PEDRO.

The southwestern outpost of America's coming struggle for the trade of the Pacific is the port of San Pedro, twenty-five miles from the city of Los Angeles, the metropolis of the south-

the lumber trade; today San Pedro has her established lines running to Mexico, Panama, Chili, the China coast, Honolulu and the north.

San Pedro was not until recently a

veloped back-country and their continental railroads, long ago attracted the rich trade of the Pacific and fattened upon it, but the southwestern states, Arizona, Nevada, and southern Cali-



SAN PEDRO HARBOR.

west. But yesterday it was a little fishing village among shifting sands, nestled below a hill by the sapphire waters of the Santa Barbara channel. Today

port of entry, her harbor being known as the Bay of Wilmington, a little defunct village which once carried on some trading a short distance above

fornia were slower in development and had not the resources to maintain sea trade. The building of the Santa Fe and Salt Lake roads and their exten-



SAN PEDRO HARBOR FROM THE EAST SIDE.

there are millions of dollars invested in its harbor improvements, millions of feet of lumber blocking its wharves, and mighty railroad systems fighting for its favor. Yesterday the harbor was entered by occasional coasters in

the present port. Vessels still come to San Pedro with papers for Wilmington, as in the days when Dana was before the mast, and same to Wilmington for hides. San Francisco, Seattle and Portland with their rich and de-

sion to San Pedro opened all the southwest as far north as Colorado, and as far south as the northern states of Mexico, to direct communication with that port, and immediately led to the development of a colossal lumber

trade by which the wharves of San Pedro supply all that tremendous area.

But if the assistance of three trans-continental railroads opened the way to a great and growing coasting trade, and drew the commercial lines of the southwest anew, it could not alone make this port a formidable competi-

tion miles nearer the coal fields of West Virginia, Tennessee, and Alabama, the source of the best steam coal, than is San Francisco, and has a very important advantage in the matter of lesser grades over which these shipments must come. Coal shipments by sea have a similar marked advantage.

It is apparent then that so far as

on the west coast and has brought to Los Angeles many industries which had their place in the stricken city. All of the sparsely settled neighboring states which had until that time looked to San Francisco for their supplies are now buying in Los Angeles or the east, and Los Angeles, quick to seize the occasion, is straining every nerve to hold permanently this business. Ships from Mexico and Central America which never before stopped at the port now make regular stops at San Pedro and are securing constantly increasing freights.

The fall of Manila with the annexation of Hawaii, Guam, Tutuila and all the Philippines opened the eyes of the American merchant to the possibilities of Pacific trade founded upon these outposts, and San Pedro was quick to improve her opportunities.

In August of 1898 while Dewey was still in Manila, agitation for the upbuilding of a free port for San Pedro was begun and congress was induced to appropriate \$1,200,000 for the construction of a breakwater nine thousand feet long, of which the substructure is now practically complete and the superstructure is approaching completion. This splendid structure, embracing the outer harbor in general easterly and westerly direction, will cost when completed about three millions of dollars, and will embrace and protect a harbor 615 acres in extent.

The prevailing winds are northwest-

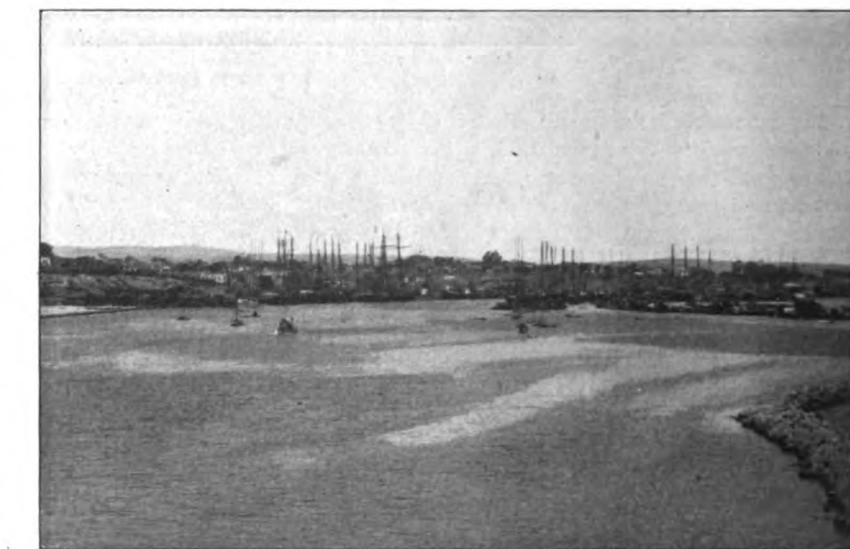


INNER HARBOR OF SAN PEDRO.

tor for deep-sea trade. Let us glance for a moment at the chart of the Pacific, that chart which the American shipper and manufacturer has never laid aside since that eventful May day when he first looked for the island of Luzon. Ninety miles north of the Mexican border and the harbor of San Diego, and 400 miles south of San Francisco we find San Pedro in the lee of Santa Catalina island at the southern entrance of the Santa Barbara channel. Twenty-nine hundred miles to the south and east lies Panama, and twenty-one hundred miles to the west and south lies Honolulu.

Draw a great circle course from Panama to Yokohama and it will pass within thirty miles of San Pedro, but not within 300 miles of San Francisco. In actual practice steamers on the course from Mexican, South American and Central American ports pass within a hundred miles of this port en route to Asiatic ports. If, however, they desire to pass on the inside course, that is through the Santa Barbara channel, they pass within sight of the port light. Ships going to Asia from the canal when that great waterway is finished will thus pass within hail of San Pedro on their course, and might here replenish their coal supply without going out of their course. Here again San Pedro is five hundred

miles nearer the coal fields of West Virginia, Tennessee, and Alabama, the source of the best steam coal, than is San Francisco, and has a very important advantage in the matter of lesser grades over which these shipments must come. Coal shipments by sea have a similar marked advantage. It is apparent then that so far as



SAN PEDRO HARBOR AS SEEN FROM DEADMAN'S ISLAND.

location is concerned San Pedro is equipped for the struggle for trade. The country back of her is an agricultural, fruit-raising, and mining country needing manufactures, lumber and

coal. Her fruit is sought after in every market in the world and with the completion of the canal would be laid down in London and Hamburg as cheaply as in Boston or New York. The destruction of San Francisco has broken many of the established lines of trade

seldom any fogs and the harbor presents no difficulties to either coaster or deep-draught steamer.

The Southern Pacific railroad, the Salt Lake, Los Angeles & San Pedro Railroad Co., and the Banning company have exclusive wharves at San Pedro along the inner harbor, and have

splendid extension of her inner harbor however and desires to extend it to the northward as far as Wilmington. This project has the approval of the government engineers and will doubtless be undertaken by private capital. It will require the removal of twenty million cubic yards of material and the

This project also has been approved by the federal engineers and with ample capital behind it seems likely of realization.

Plans for a turning basin beyond the present inner harbor provide for the largest ships, and this work will doubtless be undertaken whether the Wilmington extension is constructed or not.

Standing like a monitor at the entrance of the inner harbor is a pile of rocks known as Deadman's Isle. This has gradually become attached to Terminal island, and the outflow from the dredges has further extended the shoals on the seaward side so that an area of 80 acres will presently be added to the available land lying along the inner harbor. This part of San Pedro, known as East San Pedro, recently became annexed to Long Beach, thus complicating the harbor question to some extent by the intrusion of another governing authority, but it seems probable that in the near future the whole question of municipal rights will be settled by the annexation of Long Beach, San Pedro and Wilmington to the rapidly growing city of Los Angeles.

The land thus made between Deadman's island and Terminal island is claimed by squatters and by the Salt Lake railroad but neither party has been permitted by the Federal authorities to perfect any title and it will



SAN PEDRO, LOOKING DOWN THE CHANNEL TOWARDS THE OUTER HARBOR. DEADMAN'S ISLAND IN THE CENTER.

so improved and extended their holdings that the local shippers long ago set up the cry for a free harbor, fearing that all available wharf space would soon belong to these corporations. This inner harbor is little more than an enlarged slough extending for two miles or more in a northerly direction from the outer harbor. Outside of it lies Rattlesnake island now called Terminal island, over which run the tracks of the Salt Lake road, and upon the eastern shore is the terminus of the Southern Pacific tracks, and the extensive wharves of that company.

For the improvement of this inner harbor congress has appropriated \$150,000 a year, and the work of dredging has been rapidly prosecuted. A 20-in. suction dredge with a capacity of 5,000 cu. yds. a day was recently built by the Ellicott Machine Co., of Baltimore, for this work, and is the largest machine of its kind on the coast. Dredging has been pushed to a depth of not less than 24 ft. below low water for the full width between wharves, making a channel 3,000 ft. long and 340 ft. wide. This has added over 2,000 ft. to the available wharfage for deep-draught ships. A further contract has been let for the digging of a channel 400 ft. wide across the harbor bar. This bar now has 18 ft. at low water and will be dredged to 22 ft.

San Pedro is not satisfied with this

construction of three additional suction dredges.

Other changes in the physical condition of the harbor are suggested from day to day, as the demands of its growing trade are more clearly re-



A VIEW OF THE INNER HARBOR OF SAN PEDRO.

alized. One of the plans looks to the filling in of that part of the harbor which lies along the bluff and which is somewhat shoal. It is proposed to fill this in over an area of 153 acres, extending 2,800 ft. from the shore out to deep water, thus affording ample space for roads, warehouses and wharves.

doubtless be some time before the conflicting interests to this valuable property are adjusted. The Salt Lake road thus intrenched on the east bank of the inner harbor is straining every nerve to keep up with its formidable rival, the Southern Pacific, whose extensive yards lie along the west bank.

Both railroads are rapidly extending their dock frontage.

The Banning Co. which owns Santa Catalina island and maintains a line of steamers running between Avalon and San Pedro has its yards and docks on Terminal island as well as a ship and boat building shops. Here are built the famous "glass bottom"



FOREIGN COMMERCE OF SAN PEDRO. THE STEEL SHIP VILLE DE MULHOUSE OF HAVRE.

boats which delight the visitors to Catalina with views of the clear depths about her shores.

One of the interesting features of this part of San Pedro is the settlement of fishermen, Italians and Sicilians for the most part, who make their catch in the channel and along the shores of Catalina. Forty boats under power and sail and over five hundred men are engaged in this fishery. The boats are sloops and luggers of ample beam, painted the bright colors which the Neapolitan fisherman loves, and they are for the most part equipped with auxiliary power. That their catch is of importance is evidenced by the fact that there were shipped from San Pedro last year 4,250,000 lbs. of fresh fish, valued at \$212,500. In addition to fresh fish 140,000 lbs. of lobsters and 182,000 lbs. of dried abalones were exported.

Turning to the docks of San Pedro we find them at all times of the year blocked by great piles of lumber. Lumber is the one great commodity upon which the port is built. All the southwestern states and nearby Mexico must get their supply of lumber from the docks of this port, and the lumber-shover is never without employment. During the year just past

there was nearly 500,000,000 ft. unloaded here, as against 384,000,000 ft. the year before. Included in this aggregate were 214,000,000 shingles, 4,784,000 shakes, 35,780,000 laths, 26,483 poles, and 292,000 ties. This tremendous output comes from Oregon and Washington, and is transported mainly in huge four-masted schooners and barkentines, though there are some steamers in the trade. With the prevailing northwest wind these ships make fast passages down the coast, going back in ballast for the long beat to windward. The total tonnage for last year was 647,352, this being divided between 995 steamers and 410 coasters. These vessels carried as crew a total of 25,000 men.

In addition to the lumber receipts there were entered at the port 14,000 tons of merchandise, 115,119 sacks of grain, 16,977 tons of wheat, 3,000 tons of coal, 6,659 sheep and 1,089 head of cattle.

But on the export side of the account we find ample room for growth and improvement. Shipments on outgoing vessels included 12,582 tons of merchandise, 2,582 tons of asphaltum, 13,741 barrels of oil, and 150 tons of salt, this salt being evaporated from sea water.

These figures are given as of the year 1905 for the reason that the destruction of San Francisco and the subsequent longshoremen's strike so demoralized the trade of San Pedro during the spring and summer of this year that the statistics do not represent the trade of the port in its normal condition. There is one noticeable element in the trade of the year which is a strong indication of changing conditions. Whereas in 1905 but three foreign vessels touched at this port and they were German ships laden with cement, this year has seen a foreign ship in harbor each month, with indications of permanent trade with Japan and South America.

Warehouses and factories are beginning to seek locations about San Pedro for the collection and manufacture of the goods which shall fill the holds of the ships which are now going away in ballast. The Craigs, of Toledo, are reported to be about to erect an extensive ship yard, and all the activities which inevitably gather about a prosperous port are gathering about San Pedro. The greatest of lumber ports has had a vision of the possibilities of deep-sea trade and with millions of dollars of local and national funds and the nucleus of a great trade, has set about the preparation of a fitting trade port for the metropolis of the southwest.

ALCOHOL AS FUEL.

An investigation into the possibilities of alcohol as a fuel in small gas engines is about to be begun by Prof. Charles E. Lucke, of Columbia university, for the United States department of agriculture, in the laboratories of Columbia. At the last session of congress the internal revenue tax was removed from denatured alcohol, so as to permit of its use for industrial purposes. This law goes into effect Jan. 1, 1907. As a result it is expected that very large quantities of this alcohol will be used as fuel for small engines, in automobiles, boats, and for stationary work. It is expected that this will increase the products of the farm, nearly all of which can be utilized for alcohol manufacture.

The use of grain and potatoes for the production of this industrial alcohol will tend to maintain the price of these farm products in times of plentiful crops, and will make it possible to keep under cultivation land that otherwise would be idle, as this alcohol can be used by the farmer not only to operate machinery, but also for heat and light. Isolated districts will thereby become more independent of coal and oil. One of the advantages of alcohol aside from its convenience is its lack of odor. It is also safer, because it is possible to put out an alcohol fire with water, where it is impossible to extinguish burning oils.

Prof. Lucke will collect the results of the experiments conducted on the use of alcohol in engines, which have been carried out both here and abroad, and will expand the information by further experiments. All of this data, together with a complete bibliography of the subject, will be issued by the department of agriculture in the form of a bulletin for free distribution in January, 1907, when the law goes into effect.

Capt. S. Bonifield, former master of the steamer J. B. Stetson, has just appealed to United States Supervising Inspector Birmingham from the decision of the United States local inspectors at Seattle, who suspended his license for one year. Capt. Bonifield was in command of the steamer Stetson when she ran into the barkentine Jane L. Stanford off the mouth of the Columbia river. This is the third time Bonifield has been suspended within the past two years. Capt. Tribble, who was acting as mate and was on the bridge at the time of the collision, was suspended for six months. Capt. Tribble was also in command of the steamer Sausalito when the latter collided with the steamer San Rafael, sinking her.

WHAT CONGRESS DID FOR THE MERCHANT MARINE.

Below are given a complete set of the acts of the first session of the fifty-ninth congress just closed, relating to the merchant marine and dealing with the work of the Bureau of Navigation. To those who desire to know precisely what congress did for the merchant marine during its session, the symposium herewith is of great value.

Section 4421 of the revised statutes relating to the inspection of steam vessels was amended to allow inspectors to give a temporary certificate to the vessel while the permanent one was being made out. Under the old conditions after inspection a vessel could not leave port until the inspector had returned to the office and made out the necessary license, which, of course, consumed time, and on the great lakes might really result in the loss of the trip. The purpose of the amendment is to obviate the necessity of this. The act is as follows:

That section 4421 of the Revised Statutes of the United States be, and it is hereby, amended by adding at the end thereof the following: "Upon such inspection and approval, the inspectors shall also make and subscribe a temporary certificate, which shall set forth substantially the fact of such inspection and approval, and shall deliver the same to the master or owner of the vessel, and shall keep a copy thereof on file in their office. The said temporary certificate shall be carried and exposed by vessels in the same manner as is provided in section 4423 for copies of the regular certificate, and the form thereof and the period during which it is to be in force shall be as prescribed by the board of supervising inspectors, or the executive committee thereof, as provided in section 4405. And such temporary certificate, during such period and prior to the delivery to the master or owner of the copies of the regular certificate, shall take the place of, and be a substitute for, such copies of the regular certificate of inspection as required by sections 4423, 4424 and 4426, and for the purposes of said sections, and shall also, during such period, be a substitute for the regular certificate of inspection as required by section 4498 and for the purposes of said section until such regular certificate of inspection has been filed with the collector or other chief officer of customs. Such temporary certificate shall also be subject to revocation in the manner and under the conditions provided in section 4453. No vessel required to be inspected under the provisions of this title shall be navigated without having on board an unexpired regular certificate of inspection or such temporary certificate," so that said section, when amended as above, shall read as follows:

"Sec. 4421. When the inspection of a steam vessel is completed and the inspectors approve the vessel and her equipment throughout, they shall make and subscribe a certificate to the collector or other chief officer of the customs of the district in which such inspection has been made, in accordance with the form and regulations prescribed by the board of supervising inspectors. Such certificate shall be verified by the oaths of inspectors signing it, before the chief officer of the customs of the district, or any other person competent by law to administer oaths. If the inspectors refuse to grant a certificate of approval, they shall make a statement in writing, and sign the same, giving the reasons for their disapproval. Upon such inspection and approval, the inspectors shall also make and subscribe a temporary certificate, which shall set forth substantially the fact of such inspection and approval, and shall deliver the same to the master or owner of the vessel, and shall keep a copy thereof on file in their office. The said temporary certificate shall be carried and exposed by vessels in the same manner as is provided in section 4423 for copies of the regular certificate, and the form thereof and the period during which it is to be in force shall be as prescribed by the board of supervising inspectors, or the executive committee thereof, as provided in section 4405. And such temporary certificate, during such period and prior to the delivery to the master or owner of the copies of the regular certificate, shall take the

place of, and be a substitute for, such copies of the regular certificate of inspection as required by sections 4423, 4424, and 4426, and for the purposes of said sections, and shall also, during such period, be a substitute for the regular certificate of inspection as required by section 4498 and for the purposes of said section until such regular certificate of inspection has been filed with the collector or other chief officer of customs. Such temporary certificate shall also be subject to revocation in the manner and under the conditions provided in section 4453. No vessel required to be inspected under the provisions of this title shall be navigated without having on board an unexpired regular certificate of inspection or such temporary certificate."

Approved, June 11, 1906.

SHANGHAIING PROHIBITED.

The barbarous custom of shanghaiing, meaning the shipping of seamen while in a drugged or drunken state, was made a penitentiary offense. This act is entitled "An act to prevent shanghaiing in the United States" and is as follows:

That whoever, with intent that any person shall perform service or labor of any kind on board of any vessel of any kind engaged in trade and commerce among the several states or with foreign nations, shall—

First. Procure or induce or attempt to procure or induce another by force, threats, or representations which the person making them knows or believes to be untrue, or while the person so induced or procured is intoxicated or under the influence of any drug, to go on board of any such vessel.

Second. Induce or procure or attempt to induce or procure another by force of threats, or by representations known or believed by the person making them to be untrue, or while the person so induced or procured is intoxicated or under the influence of any drug, to sign or in any wise enter into any agreement to go on board any such vessel to perform service or labor thereon, shall be fined not more than one thousand dollars or imprisonment for one year, or both.

Sec. 2. That whoever shall knowingly detain on board any such vessel any person induced to go on board thereof or to enter into an agreement to go on board thereof by any of the means defined in section one hereof shall be punished as provided in section one.

Sec. 3. That whoever shall knowingly aid or abet in the doing of any of the things declared unlawful by sections one and two of this Act shall be deemed a principal and punished accordingly.

Sec. 4. That sections 4, 6, and 24 of chapter 8 of the Acts of Congress, approved December 21, 1898, shall apply to all vessels engaged in the taking of oysters, anything in section 26 of said last-mentioned Act to the contrary notwithstanding.

Approved, June 28, 1906.

AMERICAN REGISTER TO FOREIGN DREDGES.

Direct injustice was done to the dredge builders of the United States by authorizing the commissioner of navigation to document as vessels of the United States the foreign built dredges Holm, Leviathan, Nerius and Triton, now employed on harbor work at Galveston. This act is as follows:

That a foreign-built dredge shall not, under penalty of forfeiture, engage in dredging in the United States unless documented as a vessel of the United States.

Sec. 2. That the Commissioner of Navigation is hereby authorized and directed to document as vessels of the United States the foreign-built dredges Holm, Leviathan, Nerius, and Triton, owned by American citizens and now employed at Galveston and the dredge Sea Lion, now under construction abroad for use at Galveston, on which an American citizen, the contractor at Galveston, has an option.

Approved, May 28, 1906.

REGULATION OF MOTOR BOATS.

Section 4426 of the revised statutes relating to motor boats was amended in important particulars, but not in a manner to which exception can soundly be

taken. Two years ago a determined effort was made to compel these small craft to carry licensed officers, meaning a licensed engineer or pilot. Obviously, such a provision would have killed the motor boat industry, since the average owner of a motor boat runs it himself and could not afford to hire a licensed officer. The exemption, however, which these small craft enjoyed from government supervision was violated by a certain element which disregarded the ordinary rules of courtesy. As some of the larger types of these craft, say approaching fifteen tons, were carrying passengers for hire, the necessity for some sort of regulation was seen. The act has, therefore, been amended that such a vessel shall carry one life preserver for every passenger carried and that no such boat while carrying passengers shall be navigated except in charge of a person duly licensed for such service by the local board of inspectors. This does not mean that the boat must carry a licensed engineer or pilot in the ordinary sense of that term, but that the owner of the craft or the person that operates it must personally take out a license through the local board of inspectors. No examination is required to obtain this license, but it can be immediately revoked by the board for misconduct or negligence or recklessness in navigation and cannot be obtained by the same person until one year has elapsed. The act reads as follows:

That section 4426 of the Revised Statutes of the United States be, and it is hereby, amended by striking out, after the words "launches of ten," and before the words "and under," the words "tons burden," and inserting in lieu thereof the words "gross tons," and by striking out, after the words "above fifteen," and before the words "carrying freight," the words "tons burden," and inserting in lieu thereof the words "gross tons," and also that said section be, and it is hereby, further amended by adding at the end thereof the following: "All vessels of fifteen gross tons or less propelled in whole or in part by gas, gasoline, petroleum, naphtha, fluid, or electricity, and carrying passengers for hire, shall carry one life-preserver, of the sort prescribed by the regulations of the board of supervising inspectors, for every passenger carried, and no such boat while so carrying passengers shall be operated or navigated except in charge of a person duly licensed for such service by the local board of inspectors. No examination shall be required as a condition of the obtaining of such a license, and any such license shall be revoked or suspended by the local board of inspectors for misconduct, gross negligence, recklessness in navigation, intemperance, or violation of law on the part of the holder, and if revoked, the person holding such license shall be incapable of obtaining another such license for one year from the date of revocation," so that said section, when amended, shall read as follows:

"Sec. 4426. The hull and boilers of every ferryboat, canal boat, yacht, or other small craft of like character propelled by steam, shall be inspected under the provisions of this title. Such other provisions of law for the better security of life as may be applicable to such vessels shall, by the regulations of the board of supervising inspectors, also be required to be complied with before a certificate of inspection shall be granted, and no such vessel shall be navigated without a licensed engineer and a licensed pilot: *Provided, however,* That in open steam launches of ten gross tons and under, one person, if duly qualified, may serve in the double capacity of pilot and

engineer. All vessels of above fifteen gross tons carrying freight or passengers for hire, but not engaged in fishing as a regular business, propelled by gas, fluid, naphtha, or electric motors, shall be, and are hereby made subject to all the provisions of section 4426 of the Revised Statutes of the United States relating to the inspection of hulls and boilers and requiring engineers and pilots, and for any violation of the provisions of this title applicable to such vessels, or of rules or regulations lawfully established thereunder, and to the extent to which such provisions of law and regulations are so applicable, the said vessels, their masters, officers, and owners shall be subject to the provisions of sections 4496, 4497, 4498, 4499, and 4500, relating to the imposition and enforcement of penalties and the enforcement of law.

"All vessels of fifteen gross tons or less propelled in whole or in part by gas, gasoline, petroleum, naphtha, fluid, or electricity, and carrying passengers for hire, shall carry one life-preserver of the sort prescribed by the regulations of the board of supervising inspectors, for every passenger carried, and no such boat while so carrying passengers shall be operated or navigated except in charge of a person duly licensed for such service by the local board of inspectors. No examination shall be required as a condition of the obtaining of such a license, and any such license shall be revoked or suspended by the local board of inspectors for misconduct, gross negligence, recklessness in navigation, intemperance or violation of law on the part of the holder, and if revoked, the person holding such license shall be incapable of obtaining another such license for one year from the date of revocation."

Approved, May 16, 1906.

REMOVAL OF DERELICTS.

The presence of several derelicts in the common ocean lanes has frequently been brought to the attention of the government with the recommendation that a vessel be constructed to secure or destroy them. An act was, therefore, passed to provide for the removal of these derelicts and other floating dangers to navigation. The act is as follows.

That the Secretary of the Treasury is hereby authorized to have constructed, at a cost not to exceed two hundred and fifty thousand dollars, a steam vessel specially fitted for and adapted to service at sea in bad weather, for the purpose of blowing up or otherwise destroying or towing into port wrecks, derelicts, and other floating dangers to navigation, said vessel to be operated and maintained by the **Revenue-Cutter Service under such regulations as the Secretary of the Treasury may prescribe.**

Approved, May 12, 1906.

ESTABLISHING COASTING DISTRICTS.

Section 4348 of the revised statutes establishing the great coasting districts of the United States is amended to read as follows:

That section 4348 of the Revised Statutes be, and hereby is, amended to read as follows:

"Sec. 4348. The seacoasts and navigable rivers of the United States and Porto Rico shall be divided into five great districts: The first to include all the collection districts on the seacoasts and navigable rivers between the northern boundary of the state of Maine and the southern boundary of the state of Texas; the second to consist of the island of Porto Rico; the third to include the collection districts on the seacoasts and navigable rivers between the southern boundary of the state of California and the northern boundary of the state of Washington; the fourth to consist of the territory of Alaska; the fifth to consist of the territory of Hawaii."

Sec. 2. That this Act shall take effect on and after Jan. 1, 1907.

Approved, May 12, 1906.

COASTING LAWS TO PHILIPPINES.

The extension of the coasting laws to include the trade of the Philippine Archipelago, originally passed two or three years ago and postponed to April, 1906, has again been postponed to April, 1909. The argument advanced in favor of this postponement has been the lack of a sufficient number of vessels of American register to take care of the trade. A sound

way to prove the lack of such vessels would be to put the law in operation for a brief period of time. There is certainly plenty of evidence to be got of American ships idle on the coast. However, it is hoped that by 1909 this much postponed act will be given a trial. Following is the act:

That on and after April 11, 1909, no merchandise except supplies for the army and navy shall be transported by sea, under penalty of forfeiture thereof, between ports of the United States and ports or places in the Philippine archipelago, directly or via a foreign port, or for any part of the voyage, in any other vessel than a vessel of the United States. But this section shall not be construed to prohibit the sailing of any foreign vessel between any port of the United States and any port or place in the Philippine archipelago: *Provided*, That no merchandise other than that imported in such vessel from some foreign port which has been specified on the manifest as for another port, and which shall have not been unloaded, shall be carried between a port of the United States and a port or place in the Philippine archipelago.

Sec. 2. That on and after April 11, 1909, no foreign vessel shall transport passengers between ports of the United States and ports or places in the Philippine archipelago, either directly or by way of a foreign port, under a penalty of two hundred dollars for each passenger so transported and landed.

Sec. 3. That sections one and two of this Act shall not apply to the transportation of merchandise or passengers between ports or places in the Philippine archipelago. Until Congress shall have authorized the registry as vessels of the United States of vessels owned in the Philippine archipelago the government of the Philippine Islands is hereby authorized to adopt, from time to time, and enforce regulations governing the transportation of merchandise and passengers between ports or places in the Philippine archipelago.

Sec. 4. That sections one and two of this Act shall not apply to the voyage of a vessel between a port of the United States and a port or place in the Philippine archipelago begun before April 11, 1909.

Sec. 5. That sections one and two of this Act shall not apply to vessels owned by the United States.

Sec. 6. That on and after the passage of this Act the same tonnage taxes shall be levied, collected, and paid upon all foreign vessels coming into the United States from the Philippine archipelago which are required by law to be levied, collected, and paid upon vessels coming into the United States from foreign countries: *Provided, however*, That until April 11, 1909, the provisions of law restricting to vessels of the United States the transportation of passengers and merchandise directly or indirectly from one port of the United States to another port of the United States shall not be applicable to foreign vessels engaging in trade between the Philippine archipelago and the United States: *And provided further*, That the Philippine Commission shall be authorized and empowered to issue licenses to engage in light-erage or other exclusively harbor business to vessels or other craft actually engaged in such business at the date of the passage of this Act, and to vessels or other craft built in the Philippine Islands or in the United States and owned by citizens of the United States or by inhabitants of the Philippine Islands.

Sec. 7. That the Secretary of Commerce and Labor shall, from time to time, issue regulations for the enforcement of this Act, except as otherwise provided in section three: *Provided*, That such of the navigation laws of the United States as are in force in the Philippine archipelago in regard to vessels arriving in the Philippine Islands from the mainland territory and other insular possessions of the United States shall continue to be administered by the proper officials of the government of the Philippine Islands.

Sec. 8. That all laws and parts of laws in conflict with the provisions of this Act are hereby repealed.

Approved, April 30, 1906.

FIRE PUMPS ABOARD SHIP.

Section 4471 relating to fire pumps aboard ships was amended so as to permit the pump to be located below the main deck of the vessel. Heretofore, these pumps had to be carried on the main deck, but obviously, with changed conditions of service, as for instance in car ferries, it

was not always possible to put them on the main deck. They can now be put on other decks, but not below the lower deck of the vessel. This act is as follows:

That section 4471 of the Revised Statutes of the United States be, and it is hereby, amended by striking out after the words "is afloat," and before the words "Every steamer," the words "and no fire pump thus provided for shall be placed below the lower deck of the vessel," so that said section when amended shall read as follows:

"Sec. 4471. Every steamer permitted by her certificate of inspection to carry as many as fifty passengers, or upward, and every steamer carrying passengers, which also carries cotton, hay, or hemp, shall be provided with a good double-acting steam fire-pump, or other equivalent apparatus for throwing water. Such pump or other apparatus for throwing water shall be kept at all times and at all seasons of the year in good order and ready for immediate use, having at least two pipes of suitable dimensions, one on each side of the vessel, to convey the water to the upper decks, to which pipes there shall be attached, by means of stop cocks or valves, both between decks and on the upper deck, good and suitable hose of sufficient strength to stand a pressure of not less than one hundred pounds to the square inch, long enough to reach to all parts of the vessel and properly provided with nozzles, and kept in good order and ready for immediate service. Every steamer exceeding two hundred tons burden and carrying passengers shall be provided with two good double-acting fire pumps to be worked by hand; each chamber of such pumps, except pumps upon steamers in service on February 28, 1871, shall be of sufficient capacity to contain not less than one hundred cubic inches of water; and such pumps shall be placed in the most suitable parts of the vessel for efficient service, having suitable well-fitted hose to each pump, of at least one-half the vessel in length, kept at all times in perfect order, and shipped up and ready for immediate use. On every steamer not exceeding two hundred tons, one of such pumps may be dispensed with. Each fire pump thus prescribed shall be supplied with water by means of a suitable pipe connected therewith, and passing through the side of the vessel so low as to be at all times under water when she is afloat. Every steamer shall also be provided with a pump which shall be of sufficient strength and suitably arranged to test the boilers thereof."

Approved, June 30, 1906.

ENROLLMENT OF LICENSES.

An act was passed to simplify the use of enrollments and licenses to vessels of the United States as follows:

That under the direction of the Secretary of Commerce and Labor the Commissioner of Navigation is hereby authorized and directed from time to time to consolidate into one document in the case of any vessel of the United States of twenty net register tons or over, the form of enrollment prescribed by section 4319 of the Revised Statutes and the form of license prescribed by section 4321 of the Revised Statutes, and such consolidated form shall hereafter be issued to a vessel of the United States in lieu of the separate enrollment and license, now prescribed by law, and shall be deemed sufficient compliance with the requirements of laws relating to the subject.

Sec. 2. That section 4325 of the Revised Statutes is hereby amended to read:

"Sec. 4325. The license granted to any vessel shall be presented for renewal by endorsement to the collector of customs of the district in which the vessel then may be within three days after the expiration of the time for which it was granted, or, if she be absent at that time, within three days from her first arrival within a district. In case of change of build, ownership, district, trade, or arrival under temporary papers in the district where she belongs the license shall be surrendered. If the master shall fail to deliver the license he shall be liable to a penalty of ten dollars, which shall not be mitigated."

Sec. 3. That this Act shall not be construed to amend any law now in force concerning the compensation of officers of the customs for service connected with the enrollment and license of vessels.

Sec. 4. That this Act shall take effect on and after Jan. 1, 1907.

Approved, April 24, 1906.

STEAMBOAT INSPECTORS ON SALARY.

Section 4144 of the revised statutes relating to inspectors of hulls and boilers

of steam vessels was amended to put the inspectors on a salary instead of a fee basis. The act is as follows:

That section 4414 of the Revised Statutes of the United States be, and is hereby amended so as to read as follows:

"Sec. 4414. There shall be in each of the following collection districts, namely, the districts of Philadelphia, Pennsylvania; San Francisco, California; New London, Connecticut; Baltimore, Maryland; Detroit, Michigan; Chicago, Illinois; Bangor, Maine; New Haven, Connecticut; Michigan, Michigan; Milwaukee, Wisconsin; Willamette, Oregon; Puget Sound, Washington; Savannah, Georgia; Pittsburg, Pennsylvania; Oswego, New York; Charleston, South Carolina; Duluth, Minnesota; Superior, Michigan; Apalachicola, Florida; Galveston, Texas; Mobile, Alabama; Providence, Rhode Island, and in each of the following ports: New York, New York; Jacksonville, Florida; Portland, Maine; Boston, Massachusetts; Buffalo, New York; Cleveland, Ohio; Toledo, Ohio; Norfolk, Virginia; Evansville, Indiana; Dubuque, Iowa; Louisville, Kentucky; Albany, New York; Cincinnati, Ohio; Memphis, Tennessee; Nashville, Tennessee; Saint Louis, Missouri; Port Huron, Michigan; New Orleans, Louisiana; Juneau, Alaska; Saint Michael, Alaska; Point Pleasant, West Virginia, and Burlington, Vermont, one inspector of hulls and one inspector of boilers.

"The inspectors of hulls and the inspectors of boilers in the districts and ports enumerated in the preceding paragraph shall be entitled to the following salaries, to be paid under the direction of the Secretary of Commerce and Labor, namely:

"For the port of New York, New York, at the rate of two thousand five hundred dollars per year for each local inspector.

"For the districts of Philadelphia, Pennsylvania; Baltimore, Maryland; San Francisco, California, and Puget Sound, Washington, and the ports of Boston, Massachusetts; Buffalo, New York, and New Orleans, Louisiana, at the rate of two thousand two hundred and fifty dollars per year for each local inspector.

"For the districts of Michigan, Michigan; Milwaukee, Wisconsin; Duluth, Minnesota; Providence, Rhode Island; Chicago, Illinois, and the ports of Albany, New York; Cleveland, Ohio; Portland, Maine; Juneau, Alaska; Saint Michael, Alaska, and Norfolk, Virginia, at the rate of two thousand dollars per year for each local inspector.

"For the districts of Oswego, New York; Willamette, Oregon; Detroit, Michigan, and Mobile, Alabama, and the ports of Saint Louis, Missouri, and Port Huron, Michigan, at the rate of one thousand eight hundred dollars per year for each local inspector.

"For the districts of Pittsburg, Pennsylvania; New Haven, Connecticut; Savannah, Georgia; Charleston, South Carolina; Galveston, Texas; New London, Connecticut; Superior, Michigan; Bangor, Maine, and Apalachicola, Florida, and the ports of Dubuque, Iowa; Toledo, Ohio; Evansville, Indiana; Memphis, Tennessee; Nashville, Tennessee; Point Pleasant, West Virginia; Burlington, Vermont; Jacksonville, Florida; Louisville, Kentucky, and Cincinnati, Ohio, at the rate of one thousand five hundred dollars per year for each local inspector.

"And in addition the Secretary of Commerce and Labor may appoint, in districts or ports where there are two hundred and twenty-five steamers and upward to be inspected annually, assistant inspectors, at a salary, for the port of New York, of two thousand dollars a year each; for the port of New Orleans, Louisiana; the districts of Philadelphia, Pennsylvania; Baltimore, Maryland; the ports of Boston, Massachusetts; Chicago, Illinois, and the district of San Francisco, California, at one thousand eight hundred dollars per year each, and for all other districts and ports at a salary not exceeding one thousand six hundred dollars a year each; and he may appoint a clerk to any such board at a compensation not exceeding one thousand six hundred dollars a year to each person so appointed. Every inspector provided for in this or the preceding sections of this title shall be paid his actual and reasonable traveling expenses or mileage, at the rate of five cents a mile, incurred in the performance of his duties, together with his actual and reasonable expenses for transportation of instruments, which shall be certified and sworn to under such instructions as shall be given by the Secretary of Commerce and Labor.

"Assistant inspectors, appointed as provided by law, shall perform such duties of actual inspection as may be assigned to them under the direction, supervision, and control of the local inspectors.

"And the Secretary of Commerce and Labor may from time to time detail said assistant inspectors of one port or district for service in any other port or district, as the needs of the

Steamboat-Inspection Service may, in his discretion, require, and the actual and reasonable traveling expenses or mileage of assistant inspectors so detailed shall, subject to such limitations as the said Secretary may in his discretion prescribe, be paid in the same manner as provided in this section for inspectors."

Sec. 2. That this Act shall take effect and be in force on and after May 1, 1906.

Approved April 9, 1906.

AMERICAN REGISTER TO FOREIGN WRECKS.

Section 4136 of the revised statutes relating to the admission to American registry of repaired foreign wrecks was repealed. This act permitted the commissioner of navigation to grant American registry to any foreign vessel wrecked in American waters when it was proved by the American citizen who purchased the wreck that the repairs upon her to restore her to commission equaled three-fourths of the cost of the vessel when so repaired. Under this act many foreign vessels which became stranded in American waters found their way upon the registry books of the United States. This act was repealed by coastwise interests which resented the invasion of such vessels into their trade. Following is the act:

That section 4136 of the Revised Statutes, as amended, reading as follows: "The Commissioner of Navigation may issue a register or enrollment for any vessel built in a foreign country, whenever such vessel shall be wrecked in the United States, and shall be purchased and repaired by a citizen of the United States, if it shall be proved to the satisfaction of the Commissioner that the repairs put upon such vessel are equal to three-fourths of the cost of the vessel when so repaired," is hereby repealed.

Approved, February 22, 1906.

FISHING IN ALASKAN WATERS.

The following act was passed prohibiting aliens from fishing in the waters of Alaska:

That it shall be unlawful for any person not a citizen of the United States, or who has declared his intention to become a citizen of the United States, and is not a bona fide resident therein, or for any company, corporation, or association not organized or authorized to transact business under the laws of the United States or under the laws of any state, territory, or district thereof, or for any person not a native of Alaska, to catch or kill, or attempt to catch or kill, except with rod, spear, or gaff, any fish of any kind or species whatsoever in any of the waters of Alaska under the jurisdiction of the United States: *Provided, however*, That nothing contained in this Act shall prevent those lawfully taking fish in the said waters from selling the same, fresh or cured, in Alaska or in Alaskan waters, to any alien person, company, or vessel then being lawfully in said waters: *And provided further*, That nothing contained in this Act shall prevent any person, firm, corporation, or association lawfully entitled to fish in the waters of Alaska from employing as laborers any aliens who can now be lawfully employed under the existing laws of the United States, either at stated wages or by piecework, or both, in connection with Alaskan fisheries, or with the canning, salting or otherwise preserving of fish.

Sec. 2. That every person, company, corporation, or association found guilty of a violation of any provision of this Act or of any regulation made thereunder shall, for each offense, be fined not less than one hundred dollars or more than five hundred dollars, which fine shall be a lien against any vessel or other property of the offending party or which was used in the commission of such unlawful act. Every vessel used or employed in violation of any provision of this Act or of any regulation made thereunder shall be liable to a fine of not less than one hundred dollars nor more than five hundred dollars, and may be seized and proceeded against by way of libel in any court having jurisdiction of the offense.

Sec. 3. That the violation of any provision of this Act or of any regulation made thereunder may be prosecuted in any United States district court of Alaska, California, Oregon, or Washington.

Sec. 4. That the collector of customs of the

district of Alaska is hereby authorized to search and seize every foreign vessel and arrest every person violating any provision of this Act or any regulation made thereunder, and the Secretary of Commerce and Labor shall have power to authorize officers of the navy and of the revenue-cutter service and agents of the Department of Commerce and Labor to likewise make such searches, seizures, and arrests. If any foreign vessel shall be found within the waters to which this Act applies, having on board fresh or cured fish and apparatus or implements suitable for killing or taking fish, it shall be presumed that the vessel and apparatus were used in violation of this Act until it is otherwise sufficiently proved. And every vessel, its tackle, apparatus, or implements so seized shall be given into the custody of the United States marshal of either of the districts mentioned in section three of this Act, and shall be held by him subject to the proceedings provided for in section two of this Act. The facts in connection with such seizure shall be at once reported to the United States district attorney for the district to which the vessel so seized shall be taken, whose duty it shall be to institute the proper proceedings.

Sec. 5. That the Secretary of Commerce and Labor shall have power to make rules and regulations not inconsistent with law to carry into effect the provisions of this Act. And it shall be the duty of the Secretary of Commerce and Labor to enforce the provisions of this Act and the rules and regulations made thereunder, and for that purpose he may employ, through the Secretary of the Treasury and the Secretary of the Navy, the vessels of the United States revenue-cutter service and of the navy: *Provided, however*, That nothing contained in this Act shall be construed as affecting any existing treaty or convention between the United States and any foreign power.

Approved, June 14, 1906.

QUARANTINE STATIONS.

An act was passed to protect the public health and make more effective the national quarantine by giving the secretary of the treasury the management of all quarantine stations and authorizing him to designate suitable places for such stations, including the group of islands known as the Dry Tortugas at the western end of Florida reef. The purpose of this measure, which is as follows, is to more effectively fight the yellow fever plague:

That the Secretary of the Treasury shall have the control, direction, and management of all quarantine stations, grounds, and anchorages established by authority of the United States, and as soon as practicable after the approval of this Act shall select and designate such suitable places for them and establish the same at such points on or near the coast line of the United States or the border of the United States and a foreign country, as in his judgment are best suited for the same and necessary to prevent the introduction of yellow fever into the United States, and, in his discretion, he may also establish at the group of islands known as the Dry Tortugas, at the western end of the Florida reef, and at such other point or points on or near the coast line of the United States (not to exceed four in the aggregate) as he deems necessary, quarantine grounds, stations, and anchorages, whereto infected vessels bound for any port in the United States may be detained or sent for the purpose of being disinfected, having their cargoes disinfected and discharged, if necessary, and their sick treated in hospitals until all danger of infection or contagion from such vessels, their cargoes, passengers, or crews has been removed.

Sec. 2. That in cases in which the title to the land and water so selected and designated is in the United States it shall be the duty of the department, bureau, or official of the United States having custody or possession of such land and water, or any part thereof, not used by the government for other purposes designated by law, or possession of said Dry Tortugas Islands, on demand of the Secretary of the Treasury, to deliver the same into his custody and possession for the use of the Public Health and Marine-Hospital Service, evidencing such delivery by a suitable instrument in writing to be delivered to the Secretary of the Treasury. That in cases in which the title to such land and water, or any part thereof, is in any other owner than the United States it shall be the duty of the Secretary of the Treasury to secure the title and possession of the same to the United States for the use of the Public Health and Marine-Hospital Service of the United States, by purchase at a reasonable price, if possible; but if, in his judgment,

the price demanded for such property be excessive, he is hereby authorized to apply to the Attorney-General of the United States to cause to be instituted, in the proper tribunal, condemnation proceedings in the name of the United States for the purpose of acquiring for the United States the title and possession of such land and water, and said Attorney-General shall, as soon as possible after such application by the Secretary of the Treasury, cause such proceedings to be instituted and conducted to a conclusion, and the custody and possession of such land and water, when duly acquired in accordance with the award made in such condemnation proceedings, shall be delivered to the Secretary of the Treasury for the use of the Public Health and Marine-Hospital Service.

Sec. 3. That on acquiring possession of any land and water in accordance with the provisions of this Act for the purpose of establishing thereat a quarantine station and anchorage, the Secretary of the Treasury shall cause to be published in such newspapers as he may think proper, once a week for four successive weeks, a notice of the selection and designation of such places for quarantine stations and anchorages, with a description of the boundaries of such quarantine stations and anchorages, and such rules and regulations as he shall adopt and promulgate, requiring vessels with yellow fever among their passengers or crews to go to specified quarantine stations and anchorages, to be dealt with there before visiting any port of the United States. He shall establish at such quarantine stations and anchorages all necessary instrumentalities for disinfecting vessels and their cargoes, and where the same shall be required shall erect the necessary hospital buildings and install the necessary furniture and fittings for receiving and treating the sick among the passengers and crews of vessels going to such quarantine stations and anchorages, and provide for the separation of those among their passengers and crews who are suffering from yellow fever from those who are in good health, and shall further provide for doing all things necessary to eradicate such disease from such vessels, their cargoes, passengers, and crews.

Sec. 4. That any vessel, or any officer of any vessel, or other person other than state health or quarantine officers entering within the limits of any quarantine grounds and anchorages, or any quarantine station and anchorage, or departing therefrom, in disregard of the quarantine rules and regulations or without the permission of the officer in charge of such quarantine ground and anchorage, or of such quarantine station and anchorage, shall be deemed guilty of a misdemeanor and upon conviction thereof shall be punished by a fine of not more than three hundred dollars or by imprisonment for not more than one year, or both, in the discretion of the court. That any master or owner of any vessel violating any provision of this Act, or any provision of an Act entitled "An Act granting additional powers and imposing additional duties on the Marine-Hospital Service," approved Feb. 15, 1893, or violating any rule or regulation made in accordance with this Act or said Act of Feb. 15, 1893, relating to the inspection of vessels, or to the prevention of the introduction of contagious or infectious diseases, into the United States, or any master, owner, or agent of any vessel making a false statement relative to the sanitary condition of such vessel or its contents, or as to the health of any passenger or person thereon shall be deemed guilty of a misdemeanor, and on conviction thereof shall be punished by a fine of not more than five hundred dollars or imprisonment for not more than one year, or both, in the discretion of the court.

Sec. 5. That in any place where a quarantine station and plant is already established by state or local authorities it shall be the duty of the Secretary of the Treasury, before selecting and designating a quarantine station and grounds and anchorage for vessels, to examine such established stations and plants, with a view of obtaining a transfer of the site and plants to the United States, and whenever the proper authorities shall be ready to transfer the same or surrender the use thereof to the United States, the Secretary of the Treasury is authorized to obtain title thereto or possession and use thereof, and to pay a reasonable compensation therefor, if, in his opinion, such purchase or use will be necessary to the United States for quarantine purposes and the quarantine stations established by authority of this Act shall, when so established, be used to prevent the introduction of all quarantinable diseases.

Sec. 6. That whenever any established station, or any land or water, or any part thereof, shall be acquired by the United States under the provisions of this Act, jurisdiction over the same shall be ceded to the United States by any state in which the same is situated before any compensation therefor shall be paid.

Sec. 7. That the sum of five hundred thousand dollars, or so much thereof as may be

necessary, is hereby appropriated, out of any money in the treasury not otherwise appropriated, for the purpose of carrying into effect the provisions of this Act, as well as for the purpose generally of preventing the importation of yellow fever and other quarantinable diseases into the United States, and for the further purposes, in co-operation with state or municipal health authorities, of eradicating them should they be imported, of preventing their spread from one state into another state, and of destroying their causes.

Approved, June 19, 1906.

INSPECTION OF FOREIGN VESSELS.

The amendments to section 4400 relating to the inspection of foreign steam passenger vessels are of interest on the great lakes. For some years France, Germany and the Netherlands have had a reciprocal agreement with the United States whereby vessels were respectively inspected according to the laws of their own country, in other words, the certificate which the vessel carried was sufficient and no further inspection was necessary to satisfy the local inspector that the conditions of equipment were such as were needed in the certificate. England and, of course, Canada did not enter into this reciprocal agreement. Orders were, therefore, issued that whenever a Canadian vessel of that character visited American waters she was to be inspected precisely as though she was an American ship and fees assessed accordingly. The enforcement of this policy promptly brought Canada into the reciprocal fold, so that Canadian vessels in American waters are now inspected merely according to Canadian rules. The amendment is as follows:

Sec. 4400. All steam vessels navigating any waters of the United States which are common highways of commerce or open to general or competitive navigation, excepting public vessels of the United States, vessels of other countries, and boats propelled in whole or in part by steam for navigating canals, shall be subject to the provisions of this title.

"And all foreign steam vessels carrying passengers from any port of the United States to any other place or country shall be subject to the provisions of sections 4417, 4418, 4421, 4422, 4423, 4424, 4470, 4471, 4472, 4473, 4479, 4482, 4488, 4489, 4496, 4497, 4499, and 4500 of this title, and shall be liable to visitation and inspection by the proper officer, in any of the ports of the United States, respecting any of the provisions of the sections aforesaid: *Provided, however,* That when such foreign passenger steamers belong to countries having inspection laws approximating those of the United States, and have unexpired certificates of inspection issued by the proper authorities in the respective countries to which they belong, they shall be subject to no other inspection than necessary to satisfy the local inspectors that the condition of the vessel, her boilers, and life-saving equipments are as stated in the current certificate of inspection; but no such certificate of inspection shall be accepted as evidence of lawful inspection except when presented by steam vessels of other countries which have by their laws accorded to the steam vessels of the United States visiting such countries the same privilege accorded herein to the steam vessels of such countries visiting the United States; it being further provided that there shall be collected and paid into the treasury of the United States the same fees for the inspection of foreign passenger steamers carrying passengers from the United States that any foreign nation shall charge the merchant vessels of the United States trading to the ports of such nationality; it being further provided that the Secretary of Commerce and Labor shall have the power to waive at any time the collection of such fees upon due notice of the proper authorities of any country concerned that the collection of fees for the inspection of American steam merchant vessels has been discontinued.

"It is further provided that the Secretary of Commerce and Labor may, in his discretion, permit any foreign passenger steamer coming within the provisions of this Act whose foreign

certificate of inspection shall have expired at sea since last leaving the country to which said vessel belongs, or while said vessel shall have been in a port of the United States, to sail upon her regular route without undergoing any further inspection than would have been required had said foreign certificate of inspection been in force: *Provided, however,* That such discretion shall be exercised only with respect of vessels operated upon regularly established lines, and in cases where such foreign passenger steamers will be regularly inspected by the authorities of her home government before her next return to a port of the United States."

Sec. 2. That this Act shall take effect from and after its passage and approval.

Approved, March 17, 1906.

The act relating to the anchorages and removal of vessels in St. Mary's river was amended to read as follows:

That section one of this Act approved March 6, 1896, entitled "An Act relating to the

NAVIGATION OF ST. MARY'S RIVER.

anchorage and movements of vessels in Saint Mary's River" be, and hereby is, amended to read as follows:

"That the Secretary of Commerce and Labor be, and he hereby is, authorized and directed to adopt and prescribe suitable rules and regulations governing the movements and anchorage of vessels and rafts in Saint Mary's River from Point Iroquois, on Lake Superior, to Point Detour, on Lake Huron, and for the purpose of enforcing the observance of such regulations the Secretary of the Treasury is hereby authorized to detail one or more revenue cutters for duty upon the request of the Secretary of Commerce and Labor on said river."

Sec. 2. That section three of the Act of March 6, 1896, aforesaid, be, and hereby is, amended to read as follows:

"Sec. 3. That in the event of the violation of any such regulations or rules of the Secretary of Commerce and Labor by the owners, master, or person in charge of such vessel, such owners, masters or person in charge shall be liable to a penalty not exceeding two hundred dollars: *Provided,* That the Secretary of Commerce and Labor may remit said fine on such terms as he may prescribe: *Provided also,* That nothing in this Act shall be construed to amend or repeal the Act entitled 'An Act to regulate navigation on the Great Lakes and their connecting and tributary waters as far east as Montreal,' approved Feb. 8, 1895.

Approved April 26, 1906.

MOTOR BOATS ON PRIVATE VESSELS.

Section 4472 of the revised statutes was amended to permit vessels, not carrying passengers for hire, to carry on their decks small vessels using gasoline or other products of petroleum as a source of motor power. The act as originally drawn excluded all vessels from carrying motor launches, even preventing, through its interpretation, private yachts from carrying tenders operated by power. The purpose of the amendment is to permit private vessels, such as yachts, to carry motor launches, if they desire to do so. The act reads as follows:

That section 4472 of the Revised Statutes be, and the same is hereby, amended by adding thereto the following provision:

Provided, however, That nothing in the provisions of this title shall prohibit the transportation by vessels not carrying passengers for hire, of gasoline or any of the products of petroleum for use as a source of motive power for the motor boats or launches of such vessels.

Approved, May 28, 1906.

LOADING VESSELS AT NIGHT.

Section 2871 was amended to allow the granting of a special license to load or unload foreign cargoes at night. The amendment reads as follows:

That section 2871 of the Revised Statutes of the United States is hereby amended so as to read as follows:

"Sec. 2871. Upon arrival at any port in the United States of a steamship or other conveyance from a foreign port or place, or upon the arrival of a steamship or other conveyance from another port in the United States belonging to a line designated by the Secretary of

the Treasury as a common carrier of bonded merchandise, the collector of customs, with the concurrence of the naval officer, where there is one; upon or after the issuing of a general order, shall grant, upon proper application therefor, a special license to lade or unlade the cargo of said vessel or other conveyance at night—that is to say, between sunset and sunrise; but before any such special license is granted the master, agents, or consignees of the vessel or other conveyance shall execute and deliver to the collector a good and sufficient bond, to be approved by him, conditioned to indemnify and save the collector harmless from any and all losses and liabilities which may occur or be occasioned by reason of the granting of such special license. And any liability of the master or owner of any such steamship or other conveyance to the owner or consignee of any merchandise landed from her or other conveyance shall not be affected by the granting of such special license or of any general order, but such liability shall continue until the merchandise is properly removed from the dock whereon the same may be landed. The collector, under such general regulations as the Secretary of the Treasury may prescribe, shall fix a uniform and reasonable rate of compensation for like service, to be paid by the master, owner, or consignee whenever such special license is granted, and shall collect and distribute the same among the inspectors assigned to superintend the lading or unlading of the cargo."

Approved, June 30, 1906.

CLEARANCE OF VESSELS AT SAN LUIS.

An act was passed to allow the entry and clearance of vessels at San Luis Obispo, Port Harford and Monterey, Cal. This reads as follows:

That the collector of customs at San Francisco is hereby authorized to depute an officer of the customs from his collection district to proceed to San Luis Obispo, Port Harford, or Monterey in his district for the purpose of receiving at those places the entries of vessels arriving there in ballast and of clearing them with cargoes of petroleum and its products only in the same manner as if they had proceeded to San Francisco before entry.

Approved Feb. 24, 1906.

NEW ALLOUEZ ORE DOCK.

The Allouez ore docks at Superior, Wis., the ore shipping point for the Great Northern, will, it is expected, ship 6,000,000 tons this year in con-

ing 350 pockets, being 72 ft. 8 in. high, 1,956 ft. long and capable of holding 81,500 tons of ore. The present No. 1 dock is only 57 ft. high and is so old that part of it can no longer be used. It has outlived its usefulness and in any case is too small for the present requirements of the ore trade, having only 250 pockets with a capacity of 40,500 tons. This dock is to be torn down at once and rebuilt. The work will not be delayed until the end of the ore season, for it is expected that much longer than the winter will be required for its completion, and that what may be lost in capacity this year will be more than regained with the new dock another year. The plans and specifications have been drawn up, the drawings nearly completed, in detail and the lumber ordered. When finished the new No. 1 will have 340 pockets and a total capacity of 84,000 tons, which will mean that these docks in the future will be able to care for in the neighborhood of 11,000,000 tons a year.

About 70 per cent of the lumber required must come from the Pacific coast and when one realizes that 16,000,000 ft. of lumber and 12,000, new piles will be needed, according to the specifications, the magnitude of the undertaking, which means an expenditure of between \$6,000,000 and \$7,000,000, becomes evident. From five to six thousand and piles 70 ft. long and the remainder from 35 to 40 ft. long will be necessary. In building the other docks the

docks handle on an average about 900 cars a day (20 hours), which means something less than 34,000 tons of ore. This quantity is restricted at present, however, by the shortage of cars rather than by the size and facilities of the docks.

CONTRACT FOR GARY HARBOR.

The Indiana Steel Co. has awarded to the Great Lakes Dredge & Dock Co., Chicago, the contract for the construction of the harbor and docks at Gary, Ind. The contract provides for 2,000,000 cu. ft. of dredging, the construction of 12,000 lineal feet of timber dock and breakwater, 3,000 lineal feet of concrete dock, and a concrete water intake with two 10-ft. tunnels to connect with the shore. The total cost of these improvements is stated to be \$1,500,000. Work is to be commenced at once, the contract providing for completion by Jan. 1, 1907. The harbor will have a bell-mouth entrance, will be 250 ft. wide in the clear, will extend into Lake Michigan 2,000 ft., and into the land, figuring from the present shore line, 3,160 ft. The harbor is to be dredged and leveled off at the bottom to a depth of 22 ft. below the water line. All dock piles are to be of white or burr oak, or any other approved variety of hardwood, cut from green trees within one year of driving.

After a voyage of 73 days, the large oil-carrying steamship Lansing, recently arrived at San Francisco from Philadelphia. The vessel brought 4,000 tons

Record of Ore Docks on the Great Lakes

Railway.	Location.	Dock No.	Number of Pockets	Storage Capacity, Tons	Height Water to Center Hinge Hole	Height Water to Deck of Dock	Width of Dock outside of posts	Length of Spouts	Length of Dock	Angle of Pockets
Chicago & North Western Ry.	Escanaba, Mich.	1	184	24,104	28' 10"	48' 6"	37' 0"	21' 0"	1,104'	39° 30'
"	"	3	226	30,284	31' 2"	52' 8"	37' 0"	27' 0"	1,356'	45° 0'
"	"	4	250	32,750	36' 6"	59' 2"	37' 0"	27' 0"	1,500'	45° 0'
"	"	5	232	43,152	28' 6"	53' 3"	37' 0"	21' 8"	1,392'	40° 0'
"	"	6	320	58,000	40' 0"	70' 0"	50' 2"	30' 0"	1,920'	45° 0'
"	Ashland, Wis.	1	234	42,120	40' 0"	70' 0"	48' 0"	30' 0"	1,404'	45° 0'
"	"	2	234	25,740	36' 6"	57' 8"	46' 0"	27' 0"	1,404'	42° 0'
Duluth & Iron Range Rail Road.	Two Harbors, Minn.*	1	202	40,400	35' 5"	59' 6"	49' 0"	27' 0"	1,388'	38° 42'
"	"	2	208	41,600	33' 5"	57' 6"	49' 0"	27' 0"	1,280'	38° 42'
"	"	3	170	34,000	40' 0"	66' 0"	49' 0"	27' 0"	1,054'	43° 32'
"	"	4	168	36,960	37' 0"	62' 0"	49' 0"	29' 0"	1,042'	38° 42'
"	"	5	168	33,600	30' 0"	54' 6"	49' 0"	25' 0"	1,042'	38° 42'
Duluth, Missabe & Northern Ry.	Duluth, Minn.	1	384	57,600	30' 0"	53' 0"	49' 0"	27' 9"	2,336'	45° 0'
"	"	2	384	69,120	32' 0"	57' 6"	49' 0"	27' 9"	2,336'	45° 0'
"	"	3	384	80,640	40' 7"	67' 1/2"	59' 0"	27' 9"	2,304'	45° 0'
Great Northern Ry.	Superior, Wis.	1	250	40,500	32' 9"	57' 0"	49' 0"	27' 3"	1,525'	45° 0'
"	"	2	350	87,500	40' 0"	72' 8"	62' 8"	32' 4"	2,100'	45° 0'
"	"	3	160	40,000	40' 0"	72' 8"	62' 8"	32' 4"	960'	45° 0'
Duluth, South Shore & Atlantic Ry.	Marquette, Mich.	1	270	27,000	25' 0"	45' 0"	40' 0"	20' 4"	1,700'	39° 0'
"	"	4	200	28,000	27' 9"	47' 3"	36' 8"	21' 1"	1,200'	39° 45'
Lake Superior & Ishpeming Ry.	Marquette, Mich.	1	200	36,000	30' 9"	54' 0"	50' 0"	24' 7"	1,232'	38° 40'
Wisconsin Central Ry.	Ashland, Wis.	1	314	48,356	40' 0"	66' 2"	36' 0"	27' 0"	1,908'	50° 45'
Chicago, Milwaukee & St. Paul Ry.	Escanaba, Mich.	1	240	50,400	40' 2 1/2"	66' 6"	62' 0"	120' 27' 0"	1,500'	45° 0'
Algoma Central & Hudson Bay Ry.	Michipicoten, Ont.	1	12		34' 0"	43' 4"	25' 0"	22' 6"	311' 9"	44° 0'

*312' Single Pockets, 1,076' Double Pockets.

trast to about 4,300,000 last year. This greater capacity results from the completion of the new No. 3 dock, the contract for the finishing of which was let last December. This dock, while parts of it have been in use since June 1, has just been finished. It is similar in size and capacity to the No. 2 dock, hav-

ing work was carried on from the land end outward so as to bring some of the inner pockets into service as soon as possible. In undertaking this building, however, the same plan as has been adopted at Missabe dock No. 4 will be pursued, that of working from both ends. As they now stand the Allouez

of assorted merchandise for the Union Steamship Co. The Lansing is one of the three steamers bought on the Atlantic by the Union Steamship Co., an adjunct of the Union Oil Co. She is the largest tank steamer that has come to San Francisco, her carrying capacity being 46,000 barrels.



DEVOTED TO EVERYTHING AND EVERY
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Published every Thursday by

The Penton Publishing Co.

CLEVELAND.

BOSTON	NEW YORK
DULUTH	PHILADELPHIA
CHICAGO	PITTSBURG
CINCINNATI	

*Correspondence on Marine Engineering, Ship
Building and Shipping Subjects Solicited.*

Subscription, \$3.00 per annum. To Foreign
Countries, \$4.50.

Subscribers can have addresses changed at will.

Change of advertising copy must reach this office
on Thursday preceding date of publication.

The Cleveland News Co. will supply the trade
with the MARINE REVIEW through the regu-
lar channels of the American News Co.

European Agents, The International News Com-
pany, Breams Building, Chancery Lane,
London, E. C. England.

Entered at the Post Office at Cleveland, Ohio, as
Second Class Matter.

JULY 26, 1906.

CONGRESS AND THE MER- CHANT MARINE.

In the present issue of the MARINE REVIEW will be found a symposium of acts relative to the merchant marine as passed at the last session of the present congress. The symposium is headed "What Congress Did For The Merchant Marine;" more properly it should be "What Congress Did To The Merchant Marine" for it does not appear to have done much for it.

The real way to benefit the merchant marine is to pass the shipping bill as drafted by the Merchant Marine Commission, but aside from this, numerous bills of a minor character were presented which would have materially assisted capital engaged in shipping.

The extension of the coasting laws to include the trade of the Philippine archipelago was again postponed until April, 1909. One is inclined to become

intolerant at the claim that there are not sufficient ships flying the American flag to care for this trade. Certainly lake interests that have had two ships on the coast looking for work for the past year cannot credit the statement that there are not ships enough. They believe that those that are in existence should first of all be given a chance before the cry is raised of a lack of ships. However, the operation of this act has been postponed for three years and the only thing now is to see that when the three years are passed that it is not again postponed.

Certain foreign dredges have been at work in the harbor of Galveston for some years past in violation of the law prohibiting foreign dredges from working in American waters, unless documented as an American vessel. The commissioner of navigation was directed to document dredges now at work there and also a fifth that is building abroad for this purpose. Certain Americans have specialized in the construction of dredges and have almost succeeded in meeting the low-priced products of Europe. It is unfair to now permit foreign dredges to come in because it is discriminating against an industry. If protection is the settled policy of the country it should be impartially applied.

The act placing the inspectors of hulls and boilers of steam vessels upon a salary basis is a wise one. The inspectors were formerly paid upon the fee system, the amount of the fee depending upon the number of vessels inspected. Naturally the inspector would endeavor to have as many vessels as possible to his credit, even at the expense of slighting some of them in inspection. Secretary Cortelyou pointed out very forcibly that the fee system merely placed a premium upon laxity. The new act places the service upon a more business-like basis and is welcomed by the inspectors themselves.

No quarrel can be had with the act regulating the operation of motor boats. This act is a sensible one in every particular. It requires all motor boats or gasoline launches under fifteen tons which carry passengers for hire to carry a life preserver for each

passenger carried. It also requires the person operating the boat to take out a license. This license can be secured by the owner or operator of the boat without examination, but may be revoked by the local board of inspectors for misconduct or recklessness in navigation and cannot again be obtained by the same person within one year. These provisions are sensible and no one can rightfully object to them. The original bill concerning the motor boats provided that they should carry licensed pilots or engineers which would have killed the motor boat industry as the ordinary boat of this character is operated by the owner. Usually he has not the means to employ an engineer or pilot.

Navigators have from time to time called the attention of the government to the presence of derelicts in the ocean lanes commonly traversed by the liners. As these are practically as dangerous as rocks to high-speed vessels the government has frequently been implored to destroy them. Of course, it is not possible for vessels sighting these derelicts to more than approximately define their location because they are floating all the time; nor has the ordinary steamer the means to destroy one of these floating objects when it is seen. Congress has therefore provided an appropriation for the construction of a vessel to be especially fitted for seeking out and destroying these menaces when found.

One of the most humanitarian acts passed by congress was that forbidding shanghaiing and providing serious penalties for its practice. This practice is a survival from more barbarous days and consisted of shipping seamen aboard vessels destined for long voyages while in a drugged or drunken stage. Many a seaman has recovered from a debauch to find himself in mid-ocean bound for some unknown port. The act makes shanghaiing a penitentiary offense. It is one which should be rigidly enforced. Drunkenness is a common failing among men and especially among seamen, but there is no reason why they should be unduly punished for their excesses, and none whatever that they should be imposed upon while in that condition.

CONTRACTS FOR MORE STEAMERS.

No week in the history of the lakes has been so prolific in orders for ships as the past week. Following the close of orders for five ships by Mr. James C. Wallace, of the American Ship Building Co., orders for three more were taken by Mr. Antonio C. Pessano, of the Great Lakes Engineering Works, Detroit, Mich. The largest of the three steamers secured by the Great Lakes Engineering Works was ordered by Wm. P. Snyder, of Pittsburgh. This steamer is to be 574 ft. over all, 554 ft. keel, 58 ft. beam and 32 ft. deep. Her engines are to be triple-expansion, with cylinders 24, 39 and 64 in. diameters by 42 in. stroke, supplied with steam from two Scotch boilers 16 ft. diameter and 12 ft. long, allowed 170 lbs. pressure. It is expected that this steamer will on the average draught now obtaining carry 11,000 tons of ore.

The second order was placed by Pickands, Mather & Co., of Cleveland, for a steamer to be a duplicate of that for which contract had been given to the American Ship Building Co. last week. This steamer will, therefore, be 552 ft. over all, 532 ft. keel, 58 ft. diameter and 31 ft. deep. Her engines will be triple-expansion, with cylinders 24, 39 and 65 in. diameters by 42 in. stroke. Steam will be furnished by two Scotch boilers 16 ft. diameter and 12 ft. long, allowed 170 lbs. pressure.

The third order was placed by Pennsylvania furnace interests that desire for the present to remain unannounced. This steamer will be of a smaller type, being 440 ft. over all, 420 ft. keel, 52 ft. beam and 28 ft. deep. Her carrying capacity will be about 7,500 tons. This makes six orders that the Great Lakes Engineering Works has under contract for next year's delivery, the orders being well distributed among the ore mining and steel making companies. It will be noted that like the ships let by the Pittsburgh Steamship Co. last week the two larger vessels to be built at the Great Lakes yard are to have 58 ft. beam. The Pittsburgh Steamship Co. was the first to determine upon a beam of 58 ft., allowing a greater carrying capacity and at the same time not requiring a greater reach, as far as cargo is concerned, on the part of the unloading machines.

The Great Lakes Engineering Works also closed contract on Wednesday of this week with Mr. James E. Davidson of Bay City for a freight steamer to come out next year. The vessel will be 524 ft. over all, 504 ft. keel, 54 ft. beam and 30 ft. deep. She will have triple-

expansion engines and Scotch boilers. Her hopper bottom will be straight and her anchors will be self-stowing, the same as in the Wm. P. Snyder.

This makes thirty-one vessels that the ship yards of the lakes have under order for next year's delivery, the American Ship Building Co. having twenty, the Great Lakes Engineering Works seven and the Toledo Ship Building Co. four. Nor is this the end, for other contracts are pending. Two or three of these steamers will probably be built in sufficient time to make a trip or two in the fall of 1906.

FREIGHT SITUATION.

Indications are that fall trade on the lakes will be exceedingly active. At present the feeling is decidedly firm and vessel owners expect a material advance in the grain rate. If the crop turns out as predicted, there will be a big advance in the grain rate. It would appear indeed as though the freight to be handled is more than keeping pace with the new tonnage that is being built. There is likely to be a scarcity of vessels, especially for the grain trade, this fall. The ore trade dominates so completely that even coal shippers are having difficulty in getting tonnage. Quite a number of vessel owners are bound by their contracts to go up light. The movement of vessels during the week has been quite free, yet ore is not being brought down as fast as some of the shippers would like. It is not expected now that the movement will reach 6,000,000 tons per month, and the total for the year will not be as great as originally predicted. As more vessels are loading wild this year than last, and as shippers are behind in the movement of freight, it is natural to expect an advance in rates later on.

DULUTH-SUPERIOR HARBOR.

The board of government engineers appointed to inspect the Duluth-Superior harbor reached the city this morning. The members of the board are Col. Charles E. L. B. Davis, presiding officer, Maj. David DuB. Gaillard and Maj. W. V. Judson. The program not only consists of a thorough investigation of the conditions at the harbor but includes a public meeting where the various interests are urgently requested to present the different ideas as to the betterment of the harbor. Some of the suggestions of remedies deemed necessary have been for a central canal, closing up the ones now existing at either end, for a removal of the widened portion of the Duluth canal at the inner end on the ground that the varying width of the canal disturbs

water conditions in the harbor, and for a V-shaped breakwater outside of the canal to protect the entrance. The committee will not make its report until its return to Washington but the scope of its power to recommend is unlimited and there is reason to believe that whatever is needed will be provided for.

SHIP COMMON DIVIDEND.

At a meeting of the board of directors of the American Ship Building Co. held on Wednesday an extra dividend of 2 per cent, payable Sept. 1, was declared upon the common stock. The regular dividend upon this stock is 4 per cent, payable quarterly, so that the September disbursement will be 3 per cent. Previous to the declaration of the dividend the stock had been selling at 66½¢, but dropped immediately after the dividend was declared, closing at 64½¢. The financial statement of the company will not be given out until the annual meeting in October, but of course it is known to be very favorable as the company has been doing an enormous business for the past year and was never busier than now.

STEAMER ELPHICKE SINKS.

The freight steamer C. W. Elphicke missed the harbor entrance into Cleveland during a heavy fog early Thursday morning of this week and collided with the stonework of the new breakwater at the extreme eastern end, making a great hole in her bow. She began to fill immediately and distress signals were sounded. The tug Chris Grover of the Great Lakes Towing Co.'s fleet and the life saving crew responded. Owing to the intense darkness it was fully half an hour before the Elphicke could be located. By that time her stern had sunk in 30 ft. of water, the crew being huddled in the forward end. They were taken off without loss of life. The Elphicke is a wooden steamer 273 ft. long, 42 ft. beam and 20 ft. deep. She was built in 1889 and is owned by the Gilchrist Transportation Co.

WIDENING ST. MARY'S FALLS CANAL.

Six proposals for widening St. Mary's Falls canal above the present lock were opened at Detroit by Superintendent Joseph Ripley in the absence of Col. Davis this week. There was noted a wide diversion in the bids as follows: Great Lakes Dredge & Dock Co., Chicago, \$552,530; Buffalo Dredging Co., Buffalo, \$622,080; McArthur Bros. Co., Chicago, \$957,200; H. E. Talbott & Co., Dayton, O., \$851,430; Great Lakes Construction Co., Buffalo, \$625,860; John Griffith, Chicago, \$733,280.

UPBUILDING THE MERCHANT MARINE.

Samuel Holmes, 66 Broad street, New York, in his steam vessel circular has this to say concerning the upbuilding of the American merchant marine:

"The question of support to our merchant marine is almost the question of the day in American affairs. There are several bills before congress on this question and we hope and believe the matter will be thoroughly thrashed out. There has never been as much knowledge on the subject spread before the public as there is now. The commission appointed to visit every shipping locality has reported, and a bill is introduced with its recommendations. Independent members of congress also have bills before congress upon the subject. The great fact is this. The United States foreign shipping question is the great American paradox, in that the cause of our prosperity, is, in American shipping matters, the cause of our adversity. In other words, protection, which has built up manufactures, and today enables high wages to be paid mechanics and laboring people, has also made a rich community, so that agricultural followers, who are popularly said not to benefit by the tariff, are benefited by having a rich community to purchase their crops. But the steamship has to fight it out on unequal terms, in that she meets the ships of every nation on the ocean of free trade, while she has to pay the ship builders protective prices, and the sailors protective wages. In other words, the American ship has the high cost of American business life and wages and the remuneration of free trade conditions. It seems to us that no matter how much anyone may object to government aid, he must admit that this is a case where exception ought to be made, and direct support be given. We have studied this question very thoroughly, and have come to the conclusion that the only straight national method to meet this very peculiar situation is to give a direct amount of money out of the treasury, to make up the difference of cost between running an American built steamer and a foreign steamer. Whether we like or dislike a subsidy to equalize this branch of business, it appears the only remedy, because protection has made the situation by increasing the cost of building and operating an American vessel, and, as we show all producers are benefited by protection, the disability of the American steamer can only be effectually removed by removing it. It is therefore necessary to make a cash payment to the ship equal to the increased interest on investment, due to extra price of American built steamers over foreign steamers, and increased cost of wages and living expenses.

"The American ship owner has as

much right to protection as the railroad, factory or mine and as the agriculturist gets the advantage of a rich community to sell to, he also benefits by the tariff, which destroys the merchant marine. It is thought by some that direct government aid is unconstitutional, but this view does not appeal very strongly to us, because what is asked for, is a national mercantile marine, which will be a benefit to the nation. If a subsidy to ships is unconstitutional, then a tariff for trade benefit is unconstitutional, and the eight dollars per ton protection duty upon iron and steel, together with the whole long list of specific duties in the tariff schedule will have to go. The United States (the nation) wants a national mercantile marine; it is not individual ship owners who want it. The nation wants this thing, because the nation desires to become the largest exporting country in the world, and the exporter is aided more by the ship marking his nationality, by its flag and national representatives on board the ship, than any other items, excepting cost of exports. We do not, therefore, believe it is unconstitutional for the United States to give *itself* a mercantile marine, by paying each steamship, each voyage, a direct amount of money to overcome the burdens its principle of protection has imposed upon the vessel and, in consequence, banished it practically from the ocean. To accomplish this, we suggest that the tariff be called upon for the necessary means to subsidize 2,000,000 tons of American steam tonnage for foreign trade. Let an excise be levied on the manufactures where there is a protective duty on the foreign article.

"Tax the tariff is the logical deduction to establish a fund, that our steamships may enjoy some measure of the protective tariff. This will not reduce the height of the tariff wall reared against outside competition, but by taxing every protected production, a fund can be raised to do justice to our shipping, that has hitherto been ruined by the principle of protection, as selfishly developed and applied. Some of our friends who are thinkers and writers show that our marine decadence commenced in 1828, when discriminating duties were abolished. They therefore support a 'harking back' policy, and would re-establish discriminating duties or taxes. We will do well however to keep prominently before us that up to 1828 we were an importing nation and not an exporting nation. This makes all the difference in the world. As importers, we were customers; but as exporters, we are sellers. Consequently, if we increase the cost of freight, the seller will have to pay it or lose his market. There is a great difference between today and the times before 1828, which will bear reflecting upon."

THE AMERICAN MERCHANT MARINE.

It is doubtful if the fact is generally known that in the year 1905 a larger volume of the imports and exports of the United States was carried in American vessels than in any other year since 1879. In the latter year the total value of the merchandise transported in American bottoms was \$272,015,692, as compared with \$200,607,946 last year. It is only proper to remark, however, that in this respect 1905 was an extraordinary year, for in no other year during the past quarter of a century has the foreign carrying trade in American vessels exceeded, or even closely approximated, that for the year 1879. At the same time it is highly important to note that American vessels carried 23 per cent of our imports and exports in 1879 and only 12.1 per cent in 1905. Indeed from 1879 to 1901 the decline in the proportionate amount carried by American vessels was almost uninterrupted, reaching 8.2 per cent in the latter year. Since then there has been a fairly steady and substantial recovery.

In view of the energetic efforts of the shipping interests to secure the passage of the ship subsidy bill it may be instructive to inquire more in detail as to the extent of the decline indicated above. For this purpose we present the following table, showing the total value of the imports and exports carried by American and foreign vessels for various years since 1870.

Years.	In American Vessels.	In Foreign Vessels.	Per cent American.
1870.....	\$507,247,757	\$ 255,040,793	66.5
1871.....	352,969,401	638,927,488	35.6
1875.....	314,257,792	884,788,517	26.2
1880.....	258,346,577	1,224,265,434	17.4
1885.....	194,865,743	1,079,518,566	15.3
1890.....	202,451,086	1,371,116,744	12.9
1895.....	170,507,196	1,285,896,192	11.7
1900.....	195,084,192	1,894,444,424	9.3
1905.....	290,607,946	2,103,201,462	12.1

The deplorable condition of the American merchant marine is graphically set forth in the foregoing table. The fact that this steady deterioration has been accompanied by an unparalleled increase in all forms of material prosperity throughout the country is the source of considerable mystification. Whatever the cause may be, however, there can be no question about the desirability of obtaining for American ships a much larger share of our tremendous foreign carrying trade. Thousands of our industries are now so strongly established that the country can well afford to drop many other projects for the time being in order to devote itself to the rehabilitation of our merchant marine. The subject is of such vast importance that every effort should be made to keep it before the attention of congress until an adequate remedy is provided.—*Boston Commercial Bulletin.*

QUESTIONS FOR WHEELSMEN AND WATCHMEN.—NO. 3.

Following is the third list of questions for wheelmen and watchmen. This course began in the July 12 issue of the MARINE REVIEW and was fully explained in that issue. There is appended herewith a word of explanation by Mr. Clarence E. Long for the benefit of wheelmen and watchmen who desire to answer the questions.

LIST NO. 3.

Give all shoals and principal landmarks passed on either hand. Give (mean) correct magnetic course in every case. This is done by applying to the true courses (the courses printed on the charts) the mean of the variations given at the ends of each true course. In sailing by the compass, allowance for the variation must be made in order to steer the true course.

32. Give correct magnetic course and distance from Buffalo to Erie.

33. Give correct magnetic course and distance from Buffalo to Conneaut.

34. Give correct magnetic course and distance from Buffalo to Ashtabula.

35. Give correct magnetic course and distance from Buffalo to Fairport.

36. Give true and correct magnetic courses and distances from Buffalo to a point two miles NW Cleveland Breakwater Lt. (These courses will have to be laid off on the chart.)

37. Give true courses and correct magnetic courses and distances from Buffalo to Toledo via south passage. (Lay off on chart.)

38. Give correct magnetic courses and distances from Buffalo to Bar Pt. via north passage.

39. Give correct magnetic course and distance from Port Colborne to Long Pt.

40. Give correct magnetic course and distance from Long Pt. to south-east shoal lightship.

41. Give correct magnetic course and distance from Erie to Bar Pt. via north passage.

A WORD OF EXPLANATION.

Note.—The course to be noted or taken in the first place is the true or chart course as printed on all Lake Survey charts, unless otherwise specified; or if a course is given from a certain point of departure to a certain point of destination, and the course is not printed on the chart, it must be taken off by means of parallel ruler and the chart compass diagram, or otherwise. In every case the true or chart course is to be converted into its (mean) correct magnetic course by applying the mean or average variation existing at the ends of the course, or what is the same thing, the variation for the middle of the course. For an example: "Give course and distance

from Buffalo to Erie." True course (printed on chart) is SW $\frac{1}{2}$ W, distance 77 miles; correct magnetic course SW by W, found thus:

Variation at	
Buffalo	6° 28' Wly.
Variation at	
Erie	4° 31' "
(add) 2)	10° 59'

5° 29' = $\frac{1}{2}$ point Wly.

Wly. Var. is applied to the right of a true course to obtain its correct magnetic course, and $\frac{1}{2}$ point to the right of SW $\frac{1}{2}$ W is SW by W. Since the variation is hardly ever the same at the ends of any course the variation applied at one end will not agree for the amount at the other end; it will be either too much or too little. By getting the mean of the variations at the ends of the course the amount is proportional and answers for all along the route. The amount may be too much to start with and too little to finish with, or vice versa, but what it may lack in one-half of the route it is made up by being too great for the other half of the course. Remember that in getting the mean of the variations they must both be of the same name, either both easterly or both westerly.

In correcting a true course for variation to turn or convert it into a correct magnetic course, easterly variation is allowed or applied to the left of the true course, and westerly to the right of the true course.

Do not get mixed up in thinking that you have to move the same way as the card has moved for the variation; that is, to the right for easterly and to the left for westerly. You must move just the opposite way that the card has been pulled by the variation.

Variation is said to be easterly when the north point of the card is pulled to the right or east of true north, or the true meridian; and westerly when it is pulled to the left or west of true north, or the true meridian. To prevent confusion in correcting courses south of east and west on the card, may be overcome by standing in imagination at the center of the compass (so as to look outward in all directions) and conceiving the ship to be sailing thence along any desired point to the margin of the card. Now, since easterly variation pulls the card to the right, and the ship follows the card, if not allowed for, it is clear that she is also thrown to the right; and to the left for westerly variation. It must be readily apparent that if easterly variation carries the ship to the right of all courses on the compass, that by allowing the amount of the variation to the left it must at once counteract same, and so it does. You must not get into the habit of thinking that

north is at the top and south at the bottom of the compass (as it appears on the chart from the printed compass diagrams). There is no top or bottom to the compass card, unless the course or point of the card you are (facing) steering on or the course you are correcting, is at the top. Imagine yourself at the center of the card looking outward over the course to be corrected, then to move to the left over the margin of the card from the course in question, will allow for easterly variation; and to move to the right over the circumference of the card from the course (true course) in question, will be allowing for westerly variation. Remember that the card has moved in the direction of the variation and to counteract it you must move over the margin of the card in the opposite direction; or in other words, the true directions corresponding to the magnetic directions are to the left with easterly variation and to the right with westerly variation.

On all lake survey charts you will notice double compass diagrams printed one within the other. The outside ones represent true directions and the inside ones magnetic directions. When the inside compass is slewed to the right the variation is easterly, and when slewed to the left it is westerly. On lakes Ontario, Erie, Huron, Straits of Mackinac and St. Mary's river you will find the variation to be westerly; on lakes Michigan and Superior it is easterly. On the waters first named you allow all variations to the right of the true courses to turn them into correct magnetic courses; or port for same; no matter in which quadrant of the compass your course may lie. On the other two lakes allow all variations to the left of the true course to get the correct magnetic course; or starboard for easterly variation in all cases.

Table showing fractions of a Compass Point ($11^{\circ} 15'$) and their equivalent (opposite) in degrees, minutes and seconds of arc.

Points.			
1-16	0	42	11
$\frac{1}{8}$	1	24	22
3-16	2	6	33
$\frac{1}{4}$	2	48	45
5-16	3	30	55
$\frac{3}{8}$	4	13	6
7-16	4	45	17
$\frac{1}{2}$	5	37	30
9-16	6	19	41
$\frac{5}{8}$	7	1	52
11-16	7	44	3
$\frac{3}{4}$	8	26	15
13-16	9	8	26
$\frac{7}{8}$	9	50	37
15-16	10	32	48
1	11	15	0

The above table will be convenient for turning Variation and Deviation expressed in arc into fractional points of the Compass.

You will also notice on these charts a table of "Magnetic Variations" for all the important places and points. Use

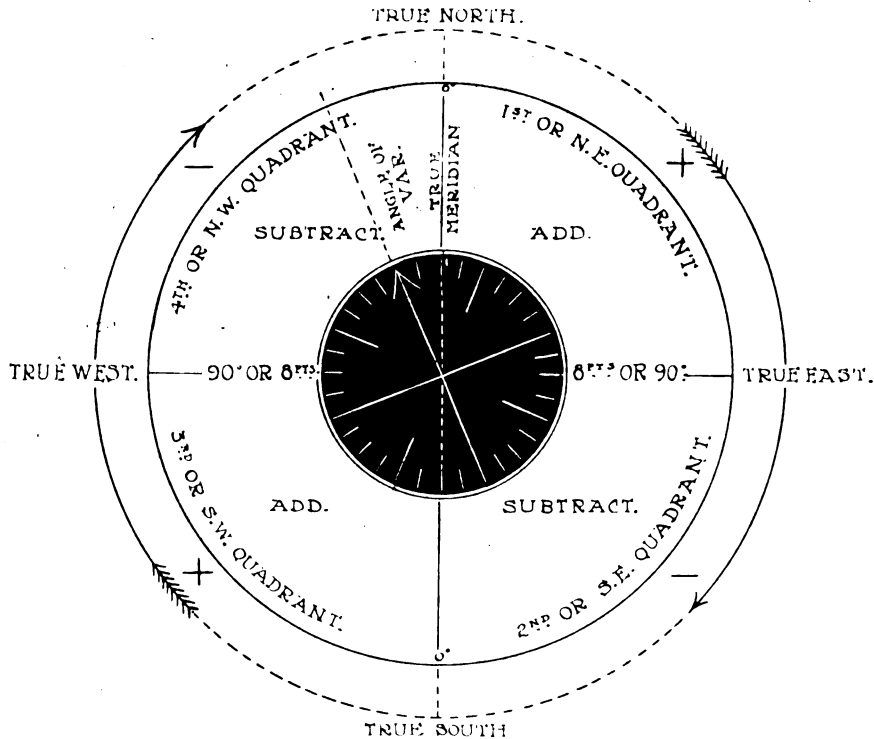
these tables altogether for getting the two variations to get the "mean" or middle variation between the ends of courses, as already shown.

The following table will be found very helpful in applying the variation as given on the chart. Variation is always expressed in degrees and minutes

ated on the earth's surface. These points are at the end of the earth's axis, and they are the starting points for direction. The magnetic meridian is in the direction of the north magnetic pole, but since this pole is some 20 degrees south of the true north pole, the needle in pointing to it must make

the magnetic north pole cannot have the same bearing from an observer situated at different points on the earth. Its bearing must change with a change of position of the observer. This is why the magnetic meridian is different at different places.

True meridians are always in the same direction and are parallel with one another, and they never change or shift their position as the magnetic meridians do; that is, to say, the true meridian of Cleveland is exactly parallel to the true meridian of Chicago, or any other place. If one man started from Cleveland and another from Chicago, and each steered true north their courses would ultimately, if it were practicable, intersect at the true north pole. If they followed the magnetic needle they would eventually reach the north magnetic pole, but, by a very devious route, they would travel altogether different courses with no regularity about them, and one might have to travel thousands of miles farther than the other in order to reach the pole, though he would be sure to reach it in time. In the case of the two men steering true north, they would be steering parallel courses all the time, and if they started from the same parallel of latitude the distances to the true pole would be identical, but not so with the magnetic pole, since the magnetic pole is situated to one side of the true pole. The north magnetic



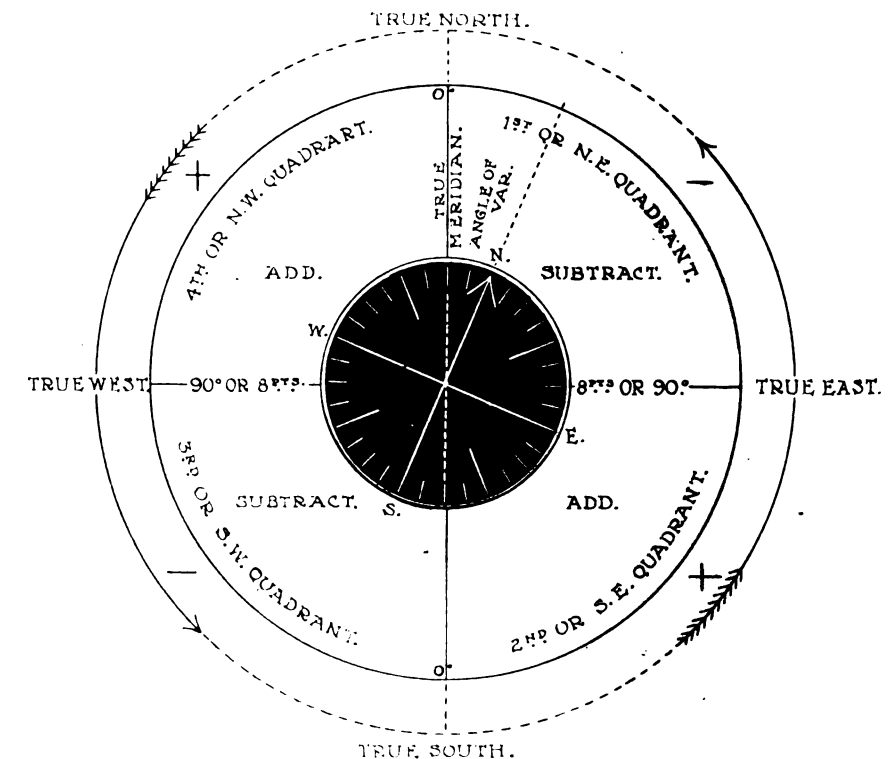
CARD SHOWING WESTERLY VARIATION AND WHY WE APPLY WESTERLY VAR. TO THE RIGHT IN CONVERTING A TRUE COURSE TO A CORRECT MAGNETIC COURSE.

of arc on the chart, and it becomes necessary to turn it into fractional parts of a point in correcting courses that are given in points. Since the variation to be applied seldom falls on the even degree, and neither does the fractional part of a point correspond to an even degree, the following table which gives the equivalent corrections in eighths of a point shows how much should be applied to the course for given angles of variation expressed in degrees and minutes of arc:

Angle of Variation.	Equivalent correction to apply to True or Chart Course.
From 0° 0' to 0° 42' allow	0
" 0° 43' " 2° 6' "	1.8 point
" 2° 7' " 3° 30' "	2.8 "
" 3° 31' " 4° 55' "	3.8 "
" 4° 56' " 6° 19' "	4.8 "
" 6° 20' " 7° 44' "	5.8 "
" 7° 45' " 9° 8' "	6.8 "
" 9° 9' " 10° 32' "	7.8 "
" 10° 33' " 11° 57' "	1

The diagrams published show the relation of magnetic and true meridians for easterly and for westerly variations, as well as the method (and reason for same) of applying variation to convert a true course or bearing to a correct magnetic course or bearing.

The true meridian is in the direction of the true poles of the earth. These always bear true north and south of you no matter where you may be situ-



CARD SHOWING EASTERLY VARIATION AND WHY WE APPLY EASTERLY VAR. TO THE LEFT IN CONVERTING A TRUE COURSE TO A CORRECT MAGNETIC COURSE.

an angle with the true meridian, and this angle is called the variation of the compass. It will be readily seen that

the pole is situated north and west of Hudson Bay on the parallel of 70°.

The true meridian of any place or

spot remains stationary, but not so with the magnetic meridian, since its direction depends on the magnet poles and these are constantly shifting their position, though slightly, the magnetic meridian must shift accordingly. When we speak of direction it is customary to regard it as being true; in fact, all directions are true in the first place and they are measured from the true meridian, or they are based upon this meridian. The compass needle points out the direction of magnetic north and to determine the direction of the needle at any place of the earth it must first be referred to the true meridian, which is the starting point of direction.

The true meridian is the line or direction from which the variation is measured, or in other words, this meridian represents zero for variation. Then, whatever the magnetic needle is turned aside or out of the true meridian, measured in degree, is the amount of the variation, at any place. All courses on a chart are measured from the true meridian, that is, the angle it makes with the true meridian. In sailing these courses by compass, or in order to make good these courses by compass, allowance for variation must be made to the true course. The true course corrected for variation is the correct magnetic course. Variation, then, is the difference between the true or geographical meridian and the magnetic meridian of any place.

True or chart course is the angle a sailing course makes with the true meridian.

A correct magnetic course is the true course corrected for variation or the angle a sailing course makes with the magnetic meridian.

VARIATION OF THE COMPASS.

"Variation of the Compass," is the term used exclusively to denote the correction of the compass (not compass error) due to the earth's magnetism, arising from the fact that the magnetic north and south poles of the earth do not coincide with the true or geographical poles. Variation may be regarded as the angle measured at the place of the observer, between the earth's nearest true and magnetic poles. A compass needle, perfectly free from the effects of iron or other magnetic substance, in obedience to the earth's influence will rest in the plane of the magnetic meridian. It is also defined as the angle between the north and south line of the card and the correct magnetic north and south line. Variation, unlike deviation, affects every point of the compass the same amount when in any one position upon the earth's surface. In compass compensation the variation, of course, is never adjusted, as it is external to the vessel,

and of different amount and name at different places. Variation is always to be found on the chart, and it is always the same at the same place, with the exception of a small annual increase or decrease. It is indicated on the compass rose of the chart for the locality you are in; also in the table of "Magnetic Variations" printed on the charts. The annual increase and decrease in the lake region is from 3' to 5'. Westerly variations are increasing and easterly variations are decreasing. This is because the north pole of the earth's magnetism is shifting or moving to the westward.

This article is written for the benefit of those wheelmen and watchmen who are desirous of entering the contest but who have never had variation explained to them. To get a clearer understanding of the subject you should read my article entitled "Shaping the Course," published in May 17 issue of the MARINE REVIEW; also the meaning of easterly and westerly explained in the issue of July 12. This subject, of course will be very thoroughly explained in my regular lessons when the time comes for it.

LONG.

FOR WHEELSMEN AND WATCHMEN.

In the first list of questions published for wheelmen and watchmen in the MARINE REVIEW July 12, questions 8, 9, 10 and 11 were not as explicit as they might be, and fearing that some of the contestants may be confused over them, they are republished to read as follows:

8. In which quadrants do you add westerly variation in converting a true course to a correct magnetic course?
9. In which quadrants do you subtract westerly variation in converting a true course to a correct magnetic course?
10. In which quadrants do you add easterly variation in converting a true course to a correct magnetic course?
11. In which quadrants do you subtract easterly variation in converting a true course to a correct magnetic course?

QUESTIONS FOR MASTERS AND MATES.—NO. 2.

Following is the second list of questions for masters and mates. The terms of the contest were explained in our issue of July 19:

1. What is meant by the directions easterly and westerly on the face of a compass card?
2. Which way does easterly variation

carry the ship if it is not allowed for?

3. Which way do you allow easterly variation in converting a true course to a correct magnetic course?

4. Where do you find the variation of the compass?

5. Is the variation given in degrees or in points?

6. How do you get the mean or average variation between a point of departure and a point of destination, or to a turning point in a course?

7. What is meant by the annual change in the variation of the compass? What is the reason for it?

8. What two kinds of variation have we on the lakes?

9. Trace the "Line of No Variation" through the lakes.

10. What does this line indicate?

11. What is the correct magnetic course between Detour and Presque Isle? (The course is based on those printed on the lake survey charts). The true course between Detour and Presque Isle is NNW $\frac{3}{4}$ W.

12. If your compass is correct how should it read when you are in range with Frying Pan and Pipe Island lighthouse? Supposing your compass reads N $\frac{5}{8}$ W, how much and which way is the deviation, and which point of the compass is this deviation?

13. The piers at Milwaukee run true east and west, the var. is $3\frac{1}{2}^{\circ}$ Ely. How had your compass ought to read coming out parallel with these piers if it were correct? Supposing it reads E by N how much and which way is the deviation?

14. What is the difference between variation and deviation? What is the reason for each?

15. Define local attraction, and tell where natural local attraction exists on the lakes?

16. How many one point courses are there on the compass card? Name them.

17. How does NNW derive its name?

18. What is the meridian of the compass, and why is it called the meridian of the compass?

19. Define meridian. What are meridians on a chart?

20. Is six fathoms a "mark" or a "deep?"

As soon as the steamer Powell Stackhouse completes her present trip Capt. P. L. Miller will leave her and go to Bay City to superintend the construction of the steamer Daniel J. Morrell, which he will bring out when completed. Capt. Wm. Megarvey becomes master of the Stackhouse and will be succeeded on his old steamer, the Republic, by Capt. Wm. A. Black, at present on the barge S. D. Warriner.

AROUND THE GREAT LAKES.

The steamer Eads put into Detroit last week for minor repairs to her engines.

Capt. John Desana, of Wyandotte, has purchased the old steamer Henry W. Johnson from the Thomas Murphy estate.

Col. M. B. Adams, United States engineer, has recommended in his report that \$65,000 be spent on the harbor at South Haven.

The steamer Wm. G. Pollock, of the Becker fleet, left Cleveland on a maiden trip this week. She is commanded by Capt. H. G. Haybarger.

The steamer Sonora, down bound, stranded at the Middle Brown Round Island last week. The lighter Rescue went to her assistance.

The new Ellsworth car ferry is now making regular trips between Port Burwell and Ashtabula. She is in command of Capt. B. T. Haagenson.

The package freighter Rochester has been purchased from the Erie railroad by Mr. S. C. McLouth, manager of the Michigan Salt Works, Detroit.

The contract for blasting and dredging of the west end channel at Sandusky has been given to T. M. Sullivan, of Detroit. The work will be started at once.

Capt. Frank C. Rae, with the steamer James C. Wallace, made a new coal record for Ashtabula last week by clearing for the head of the lakes with 11,351 tons.

The barge Santiago, in tow of the steamer Lagonda, ran on the east bank of the Lime Kilns last week. She was released after part of her cargo had been lightered on the Newman.

The new ore dock of the Chicago, Milwaukee & St. Paul railway at Escanaba was completed last week. The first cargo was taken from the dock by the steamer Mecosta on Thursday last.

The Midland Towing & Wrecking Co. has been given contract by the Canadian government for blowing up the wreck of the schooner Tasmania lost near Middle Brown light, Lake Erie, early this season.

A new life saving station will soon be established on Beaver Island at the north end of Lake Michigan, according to an announcement just made by Lieut. J. C. Ballinger, inspector of the twelfth life saving district.

Capt. B. Rieboldt, of the steamer Brazil, recently made a round trip from Green Bay to Manitowoc to Buffalo in seven days and a quarter. When he gets up above this trip it will make his twentieth this season.

A new chart of Portage Lake, Manistique county, Mich., and a revision

of coast chart No. 2, Lake Michigan, both in colors, have just been issued by the United States Lake Survey and are for sale by the MARINE REVIEW.

Application has been made to the city of Buffalo by the United States government for permission to place a beacon light in Riverside Park. It would be used as a range light by vessels navigating the Niagara river.

A slight collision occurred between the package freighter Muncy of the Anchor line and the freight steamer James P. Walsh at the mouth of the Cuyahoga river last week. The railing, bulwarks and stanchions of the Walsh were broken.

The tug Peerless of the Great Lakes Towing Co.'s fleet stationed at Amherstburg, has been transferred to Cleveland. Her place will be taken at Amherstburg by the tug Home Rule which will work in connection with the lighter Newman.

A. D. Birdsall, chief engineer of the steamer Matoa, was called home on his last trip down by the serious illness of his daughter Madge. When he left his boat at Ashtabula to proceed to his home at Unadilla, N. Y., she was not expected to live.

Mrs. Ogden McClurg, daughter-in-law of the late Gen. A. C. McClurg has been given papers as pilot and master of vessels on the great lakes. Mrs. McClurg is the first woman to receive this distinction. She is now captain of the Sea Fox.

Chief engineers on boats putting in at Lake Erie ports, particularly Ashtabula, complain that it is almost impossible to get firemen for their steamers. According to indications, it is not because the firemen are scarce, but because they are too prosperous.

E. L. Wallace is the name selected for the new steamer which is building at the Ecorse yard of the Great Lakes Engineering Works for James and Frank Wallace of Detroit. The company operating this boat will be known as the Dearborn Transit Co.

L. W. Jarvis, deputy customs collector at Ashtabula, says the water in the harbor is deep enough to permit boats with a 19.6-ft. draught coming in safely. The steamer Norton grounded last week, but the water was down a foot and she was loaded deep.

Charles R. Dettrick, a Cleveland submarine diver, who blew up the hull of the barge Yukon for the government recently, went out from Ashtabula Monday and located 1,000 feet heavy anchor chain, two anchors, boiler and donkey engine, and about 2,000 pounds of junk.

Capt. Charles B. Galton, of the steamer Loftus Cuddy, will have completed twenty years service in the em-

ploy of Capt. John Mitchell at the end of this season. This long record reveals the fact that practically all the licensed officers in the Mitchell fleet worked up from the deck.

Capt. J. C. Bell, in the steamer German, made a five-day trip from Cleveland to Marquette and back to Ashtabula. He left Cleveland at 6 a. m. Sunday, July 15, reached Marquette at 5 a. m. Tuesday, departed from there at 6.30 p. m. the same day, and put in at Ashtabula at 5 a. m. Friday, July 20.

The Welland canal was placed out of commission for a few days last week by the steamer Nipigon colliding with the gates of Lock 16. The second engineer of the Nipigon mistook an order to reverse for one to go ahead. Two other gates were carried away in the accident. This is the first serious delay that the Welland canal has suffered in some time.

The steamer Powell Stackhouse with 9,700 tons of soft coal was unloaded recently at the dock of the Milwaukee Coke & Gas Co., by their two "Brown-hoist" steam rigs equipped with two-ton grab buckets in 39 hours actual working time, an average of 249 tons per hour, or 124½ tons per hour per rig. The unloading of the entire cargo, including the cleaning up, was done by grab buckets, and for the first ten hours each machine averaged 150 tons per hour.

The steamer Henry S. Sill and the steamer Mariska collided at Southeast bend, St. Clair river. The Mariska put into Marine City and was ordered to go to the Ecorse yards of the Great Lakes Engineering Works for repairs. Her injuries were on the port bow but were largely above the water line. The Mariska was upbound with coal and the Sill was downbound with ore. As soon as the Sill delivers her cargo of ore at Buffalo she will go into dry dock there.

Chief Engineer C. H. Menmuir, of the steamer Michigan of the Cleveland-Cliffs fleet, has been sent by the company to the Ecorse yard of the Great Lakes Engineering Works, Detroit, to supervise the machinery of the steamers building there for the company, taking the place of shore engineer Thomas Durkin temporarily. Mr. Durkin is at home indisposed. John McMonagle, formerly of the Richardson fleet, has been made chief engineer of the Michigan.

The schooner Wm. Case sprung a leak in the heavy seas on Lake Erie last Sunday night and foundered in 25 ft. of water five miles northeast of Colchester light. The lost vessel was in tow of the steamer Saginaw and had been lashed to the steamer for

several hours before she foundered. The Case, which had a cargo of 557 tons of soft coal on board, was owned by the Black Diamond Transportation Co., of Detroit. The crew of the Case was taken to Detroit by the Saginaw.

The plan known as Plan C for the improvement of Buffalo river and Cazenovia creek has been approved by the board of councilmen of Buffalo. The plan provides for widening, straightening, enlarging and deepening the Buffalo river and Cazenovia creek for the purpose of altering their course and for putting the Buffalo river in navigable condition. The work is divided into four sections, as follows: Section 1.—Outlet drainage channel way from Buffalo river to Lake Erie. Section 2.—Buffalo river from the south line of lot 65, Indian reservation, to its junction with Cazenovia creek. Section 3.—Buffalo river from its junction with Cazenovia creek to the easterly city line. Section 4.—Cazenovia creek from its junction with Buffalo river to Cazenovia street.

The modern bulk carriers on the lakes are expensive properties, ranging from \$350,000 to \$500,000, so that when collisions occur between them they are likely to be costly affairs. Such is the case of the steamer Eugene Zimmerman which collided with the Saxona in St. Mary's river on her maiden trip. She has just been liberated from dry dock at Cleveland after incurring a repair bill of approximately \$60,000. The Zimmerman had to be completely rebuilt from the collision bulkhead forward. In addition, the wrecking job undertaken very successfully by Capt. Thomas Donnelly, of Kingston, Ont., was a considerable one, so that the underwriters are hit hard. Also as there does not exist on the lakes any form of insurance that guarantees earnings, the owners are deprived of three months' profit. Altogether, that collision was a costly affair. The Zimmerman is owned by L. S. Sullivan, of Toledo.

Ashabula's capacity as a harbor for the modern leviathans was taxed to the limit last Saturday when the steamer Michigan was towed through the bridge to the Angeline dock. She reached the harbor at 5 a. m., but it was a long job for the tugs to get her through the bridge. It seems certain the river will have to be straightened to get a longer boat in, because the Michigan only had a few feet to spare. Capt. S. A. Lyons, master of the Michigan, brought down a load of 9,845 tons of ore from Ashland on her maiden trip. Her running time was close enough to 11 miles an hour to make it certain the big steamer will knock off that much or more when her engines are worked out. The Michigan

is the largest boat ever brought into Ashabula harbor, and from her ship-shape appearance, it is safe to say she is as well fitted out and appointed as any boat entering the port. Her crew's quarters are as comfortable as they can be made, a library being one of the luxuries enjoyed. The passenger quarters are very sumptuous, but the comfort of the crew has not been sacrificed to make this possible. One of the features of the Michigan is the life cable between the spars with its boatswain's chair. This, however, is a feature of all the other Cleveland-Cliffs boats. Steel hatch covers have been displaced by wooden ones on her, and thirty-one hatches give her deck a remarkable appearance. Floyd Rowe, a University of Michigan junior in the engineering department, and a son of wealthy Battle Creek parents, is acting as deckhand on the Michigan. He is studying marine engineering and has taken this way of improving his knowledge of lake shipping. C. H. Menmuir is the engineer of the Michigan.

ITEMS OF GENERAL INTEREST.

Three twin-screw steel steamers for harbor service will be built by the Pusey & Jones Co., Wilmington, Del., for the quartermasters' department of the United States army. Each boat will be 86 ft. long, 20 ft. beam and 10 ft. 10 in. deep.

Plans for the largest and best dry dock in the world are being prepared in the bureau of yards and docks at the navy department. The last naval appropriation act contained a provision for a dock to cost \$1,250,000, to be constructed at the Bremerton navy yard, Puget sound, Washington. This amount is a larger sum than ever heretofore appropriated for a dock, and the new dock, when completed, will be able to take in the largest battleship either in course of construction or in contemplation. The location for the dock has already been selected at the yard, and borings are now being made to learn the depth of the foundation. It is to be a concrete dock of the latest pattern, and the materials will be purchased on the Pacific coast, if practicable. The dock is to be so constructed that it may be lengthened if vessels of greater length should be built in the future. It will be 37 ft. in depth over the sill, which will provide for the docking of any vessel likely to be built. The greater depth of the new dock is also designed to meet cases where a vessel has been injured, and draws much more than the ordinary depth on account of the injury.

Soon the United States navy will have the Pacific coast equipped with wireless stations, as the Atlantic coast is now equipped, so that messages may

be received at some stations either day or night. Wireless stations have been completed and equipped at San Diego, Arquello, Faralona and Mare island. Faralona is just outside of San Francisco harbor, and the station was located there in order to have the communication over sea as much as possible from one station to the other. Stations are now being constructed at Table Bluff, Cape Blanco, North Head, and Cape Flattery. The stations are from 130 to 210 miles apart, and when they are all erected and the apparatus installed, it will be possible to communicate the whole length of the Pacific coast, either in the day or night. It has been found that owing to electric conditions, the wireless telegraph is less efficient in the day than in the night. Any ship sailing along the Pacific coast, and equipped with wireless, will be able to communicate with the land at all times, from the northern to the southern boundary of the country.

The report adopted at the meeting of the Nippon Yusen Kaisha in Tokio on May 28 states that, according to the profit and loss account for the half year ended March 31, 1906, the gross profits of the company for the past half year amounted to 3,831,762 yen, out of which there has been paid: Depreciation of the company's fleet property, 803,141 yen; insurance fund, 337,750 yen; ships structural repair fund, 466,391 yen, leaving a balance of 3,275,985 yen, including the sum brought forward from the last account. The directors now propose that 111,223 yen be added to the reserve fund, raising it to 2,320,803 yen, and that 71,358 yen be allowed as directors' and auditors' fees; also that 60,000 yen be allowed for the managing directors, and 400,000 yen for the employees, as bonus on account of the transport business. From the remainder the directors recommend a dividend at the rate of 10 per cent, together with five per cent as special dividend, thus making 15 per cent per annum, leaving 983,403 yen to be carried forward.

The Portland Co., Portland, Me., has put out two bulletins, one descriptive of their electric hoists and the other of their electric generating sets for marine and stationary use. The work of this company is thorough and excellent. The bulletins will be sent to anyone interested upon request.

The Denver office of the Allis-Chalmers Co., of Milwaukee, has been removed to the McPhee building, Seventeenth and Glenarm streets, and their El Paso office to the Guarantee Trust building.

AT THE HEAD OF THE LAKE.

Duluth, July 23, 1906.—All the vessel interests at this harbor report an excellent movement during the past week. This means practically a big shipment of ore and it was expected by one company at least that a new seven-day record would be attained. The shipment figures of ore from the head of the lakes as just received show that there was shipped from Two Harbors 284,886 tons, from Duluth 459,211 tons and from Superior 237,321 tons, a total from the head of the lakes of 981,418 tons, which is 187,238 tons better than the preceding week. Last year for the corresponding week Two Harbors shipped 301,110 tons, Duluth 327,635 tons and Superior 177,700 tons, aggregating 806,445 tons, showing the increase this year to be for the week 174,973 tons. The shipment to date has been 10,166,205 tons as compared with 9,329,837 tons up to this time last year, a gain of 836,368 tons, which increase makes good the falling off during the week previous.

There is but little movement of grain owing to the inability to get vessels, though the rate has continued all week strongly at 2 cents. There is quite a quantity of wheat that should be shipped this month and it is believed that there is quite a possibility of an advance over the 2-cent rate. If the last two and a half months of the ore season prove to be as is expected, unusually large in that trade, the grain rate will undoubtedly take quite a jump in order to secure vessels and 5 cents is talked of. There seems to be prospect of a considerable stringency somewhere, though a number of vessels now carrying wild cargoes of ore will be shifted to grain later. The receipts and shipments of grain for the week just closed are compared below with those of a week ago.

	Receipts.		Shipments.	
	July 14	July 21	July 14	July 21
Wheat . . .	226,218	249,807	813,163	343,727
Corn . . .	23,276	5,385		
Oats . . .	397,614	331,356	353,406	379,538
Barley . . .	153,672	137,311	200	41,400
Rye . . .	3,123	1,653		
Flax's'd	432,282	497,676	331,197	804,106

As will be noted the biggest shipment was in flaxseed, nearly twice as much being carried as during the previous week. Wheat shipments were again reduced to normal after the big movement in the preceding seven days and there seems to be no prospect of any increase above the average of the past month or so, until June wheat begins to be moved in September. Reports from all parts of Minnesota show the grain to be in splendid condition and give prospects, commission men say, of an even greater harvest than the record breaker last year.

The wrecked steamer Mataafa, which has been lying in one of the harbor

slips since being brought in from the lake and while the greater part of her cargo was being lightered, was towed to the Superior ship yards last Sunday about 5:30. It was also on Sunday several weeks ago that the Mataafa was brought into the harbor. Pending the completion of preparations for drydocking her, she is now tied up at the wharf, to which place she was towed by the wrecking tug Manistique, assisted by the tug Zenith City. All of her cargo has not been removed as yet. The Superior ship yards will probably get a fair proportion of the big contracts that have been obtained recently by the American Shipbuilding Co., though the distribution of the work has not been settled. As it is the Superior Shipbuilding Co. will be busy for a year with orders now under contract.

During the week a complaint was lodged with the local inspector by Capt. Thomas Beggs of the steamer Niko, John J. Warde line, against Capt. Donald Gillis, steamer Superior, of the Western Transit Co. line. The charges state that at 1:30 o'clock on the morning of June 20 while he was leaving Duluth harbor and about to enter the canal with the barge A. M. Peterson in tow he was passed by the Superior contrary to the rules, and endangering both craft. He says that as he was about to enter the canal, the Superior, which was winding in the harbor basin, gave a short blast of her whistle as if she was going to pass the Niko and tow. The master of the Niko deeming such maneuver dangerous gave several warning blasts of his whistle, but the Superior paid no attention and proceeded out of the harbor. As she passed the Niko and Peterson, the suction was so great that it broke the tow-line between the two and a collision was narrowly averted between the two steamers.

The Peterson was drawn in the wake of the Superior out into the lake, where the Niko captured her, knotted the bow-line and proceeded on the way down the lake. Capt. Beggs alleges that as the Superior was passing him he told the former's master that he had not acted right and Capt. Gillis replied that the Niko and tow were going out too slow.

In reply to these charges Capt. Gillis filed the following:

"To the U. S. Local Inspector, Duluth, Minn.

"Referring to the charges made against me by the master of the steamer Niko, I must say that his charges are false in everything he says, except about my blowing one whistle. About 2:30 a. m., eastern time, we started to back out from the N. P. No. 2 dock. I noticed a steamer coming from the canal showing both signal lights.

"I blew one blast of the whistle, but

got no answer. Thinking that he was going to stop at the Omaha dock we backed out and went. Well over toward the yacht club house, I noticed that he turned around with his port wheel and went toward the N. P. dock No. 4. After I winded around and was headed for the canal I noticed that he was picking up a tow there and was heading for the canal also.

"I blew one blast of my whistle to pass him on my port hand, but received no reply. Then I blew another whistle and no answer came from the Niko, so I came to the conclusion that he was stopping to pick up his tows. I went ahead and when we got abreast of him I heard him give four whistles and a long one to the engineer. The time we were entering the canal he was lapping on our port quarter and we did not touch him. You can imagine how fast we were going with a start of about 1,300 feet and a boat of 6,000 tons. Very respectfully yours,

"DONALD GILLIS,

"Master Ship Superior."

The local inspector, John Monaghan, has acknowledged the receipt of both letters and in reply has advised both captains that a hearing will be given at which time witnesses may be presented to support the contention of each. The inspector has informed Capt. Gillis in addition that his reply is insufficient in that it does not state whether or not the Superior did actually pass the Niko under the conditions named in the complaint. The inspector's office also holds in view of Rule VI of the Pilot Rules of the Great Lakes that whatever he may have thought as to the intentions of the Niko he should not have passed without the proper signal from the Niko, but should have blown a warning signal and awaited an understanding with Capt. Beggs. Until the completion of the hearing, when further testimony may be presented, the decision in the case has been withheld. The penalty for the violation of the rules governing this case is a fine not exceeding \$200.

Capt. C. E. Sayre leaves the Andaste of the Cleveland-Cliffs fleet this week and will be succeeded by Capt. James Kennedy. Capt. Kennedy was with Capt. Sayre as mate on the Centurion last year and has acted as mate of the Andaste so far this year. Capt. Sayre will bring out the new steamer Ishpeming about Aug. 10.

The grain section of the Dominion marine association met at Toronto last week to discuss the prospects of handling the grain crop from the Canadian northwest this fall, which is expected to be heavy.

SCIENTIFIC LAKE NAVIGATION

By Clarence E. Long

RELATIVE BEARINGS.

Another thing that the compass student should acquaint himself with is what are called "Relative Bearings." In other words, he must know how to describe the direction in which an object lies from the vessel he is on. The direction is known as the bearing. A lighthouse sighted on the horizon may bear NE by N by compass, but its relative bearing from the vessel may be broad off the starboard quarter. The following list gives the relative bearings from a vessel heading north by compass. Object bearing.

North is dead ahead.

N by E is one point on the starboard bow.

NNE is two points on the starboard bow.

NE by N is three points on the starboard bow.

NE is broad off the starboard bow.

NE by E is three points for'ard of the starboard beam.

ENE is two points for'ard of the starboard beam.

E by N is one point for'ard of the starboard beam.

East is abeam, or on the starboard beam.

E by S is one point abaft the starboard beam.

ESE is two points abaft the starboard beam.

SE by E is three points abaft the starboard beam.

SE is broad off the starboard quarter.

SE by S is three points on the starboard quarter.

SSE is two points on the starboard quarter.

S by E is one point on the starboard quarter.

South is astern.

The bearings in the westerly half of the compass will be precisely the same with the substitution of "west" for "east" and "port" for "starboard." Thus, N by W heading north say, would be one point on the port bow; NW broad off the port bow, and so on. Quarter points have a value in relative bearings as well as the whole point; for instance, supposing the vessel is heading NE $\frac{1}{2}$ E and an object, a distant sail of a vessel, say, bears from the vessel SE $\frac{1}{4}$ E. Its relative bearing would be $\frac{3}{4}$ of a point for'ard of the starboard beam, because it is $7\frac{1}{4}$ points from the direction in which the vessel is heading; eight points from her head would be abeam and seven points

would be one point for'ard of abeam, and as this comes in between it is read $\frac{3}{4}$ of a point for'ard of abeam.

A relative bearing is the direction of an object from the ship taken in relation to the ship itself; that is, depending on that portion of the ship over which the bearing is taken. The compass is not necessarily used for taking the bearing, but by the eye alone, and as such is only approximate.

"We made the light about a quarter point on our starboard bow."

Relative bearings are used every hour of the day on board ship between the officer of the deck and the lookout; as for instance, in thick weather such expressions will be heard; the sound of the whistle bears $2\frac{1}{2}$ points on the starboard bow, or $3\frac{1}{4}$ points on the port quarter; the sea struck us about three points on the port bow, etc. Relative bearings are means of guiding vessels in safety in thick weather. The scholar should thoroughly memorize the names of the bearings, so as to be able to answer any questions relating thereto.

DIAGRAM EXPLAINING RELATIVE BEARING METHOD.

Imagine the ship's head to be on the point of the compass representing the course steered. Whatever the difference between course and bearing by compass, counting on the radial lines will give the relative bearing. For example: The ship is steering NNE, when a lighthouse bears SE by E. Difference between course and bearing is nine points. Counting nine points to starboard of the ship's head makes the relative bearing "one point abaft the starboard beam." This is a good way to learn this. It is very much like boxing the compass, but your starting point is the ship's head and not north.

If you were steering SE $\frac{1}{2}$ S by compass and an object bore directly abeam what would the object's bearing be by compass? Ans. NE $\frac{1}{2}$ E or SW $\frac{1}{2}$ W.

If you were steering W by N and you wanted to run until you were abreast of a lighthouse before you changed your course, how would the lighthouse have to bear by compass? Ans. either S by W or N by E, depending on which side you had it aboard.

It takes some experience and judgment to handle this subject intelligently, notwithstanding the fact that it is a very simple one.

THE STARBOARD BOW.

- 1—One point on the starboard bow.
- 2—Two points on the starboard bow.
- 3—Three points on the starboard bow.

B—Broad off the starboard bow.

THE PORT BOW.

- 1d—One point on the port bow.
- 2d—Two points on the port bow.
- 3d—Three points on the port bow.
- Ba—Broad off the port bow.

THE STARBOARD BEAM.

- 3—Three points for'ard of the starboard beam.

2A—Two points for'ard of the starboard beam.

1A—One point for'ard of the starboard beam.

A—Abeam, or on the starboard beam.

1b—One point abaft the starboard beam.

2b—Two points abaft the starboard beam.

3b—Three points abaft the starboard beam.

THE PORT BEAM.

3e—Three points for'ard of the port beam.

2e—Two points for'ard of the port beam.

1e—One point for'ard of the port beam.

Aa—Abeam, or on the port beam.

1f—One point abaft the port beam.

2f—Two points abaft the port beam.

3f—Three points abaft the port beam.

THE STARBOARD QUARTER.

Bb—Broad off the starboard quarter.

3c—Three points on the starboard quarter.

2c—Two points on the starboard quarter.

1c—One point on the starboard quarter.

THE PORT QUARTER.

3g—Three points on the port quarter.

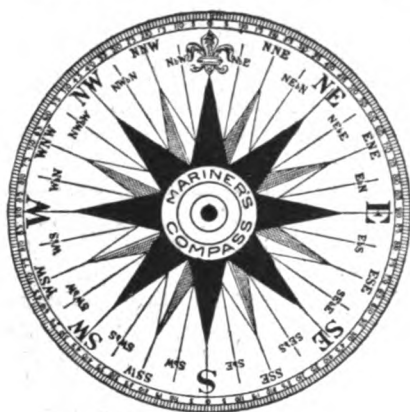
2g—Two points on the port quarter.

1g—One point on the port quarter.

The smallest inventions sometimes pave the way to the greatest discoveries. Particularly is this the case with the mariner's compass. It is but a minute nautical instrument, working upon a simple law of nature; and yet it has done more than all the combined armies that have ever been raised on earth. A thousand years ago, navigation was conducted by the aid of sight alone, and the sun, moon

and the stars were man's only guide. The boldest mariner rarely dared venture far beyond the sight of land, for the heavens were at any time liable to be overcast with clouds for days together, and then, without any guide by which to direct his course he would be utterly lost upon the trackless deep. Hence, navigation was confined to very narrow limits, and the passage of the Mediterranean Sea was looked upon as a great undertaking.

Europe, Asia and Africa, with a few



THE REGULAR CARD.

adjacent islands, constituted the whole known world. The circumnavigation of Africa by Necho, and the voyages along its shores by Sataspes and Hanno, were reckoned by the ancients as among the greatest voyages of discovery ever attempted by man. And, indeed, at that time they were; but with the discoveries in magnetism and its application in the invention of the



CHINESE COMPASS-CARD SHOWING 24 POINTS.

mariner's compass, a new aspect was given to navigation, and new pages recorded in the geography of the world.

The loadstone, which is an ore of iron of a dark color, found in various parts of the world, is a natural magnet. If needles or small bits of iron be brought near it, it will draw them instantly to its surface, and hold them there by its own power of attraction. If a piece be fastened to a cork floating upon the surface of a basin of water, it will in a short time settle in a north and south direction; and, indeed, at the time of its introduction into Europe, about the middle of the

thirteenth century, it was all there was of the mariner's compass. Even this rude instrument served as a guide, though very inaccurate, the mariner bold put out to sea, hundreds of miles from land, without fear. The inventor of this valuable instrument is unknown, though the Chinese claim the honor of the discovery.

If the north pole of a magnet be placed on the center of a steel bar, and drawn several times toward one extremity, and then reversed and the south pole drawn repeatedly from the center toward the other extremity, the bar will become magnetized. If it now be balanced upon a point it will at once commence to vibrate and ultimately settle in a north and south direction. Upon this principle the mariner's compass is constructed.

The greatest scientific minds have never yet been able to explain satisfactorily *all* the wonders of magnetism. In one sense it has a great resemblance to electricity, and it is highly probable that it may be but a modification of the same force. Like electricity it is an invisible fluid, without sensible weight, and so very subtle that it pervades all bodies capable of being magnetized. If the north pole of one magnet be placed near the north pole of another, they will repel each other; but if the north pole of one be placed near the south pole of another, they will attract each other. In this respect it is similar to the positive and negative states of electricity, and may be governed by the same law—like poles repel each other, and unlike poles attract each other.

The earth itself is supposed to be a great natural magnet, and the attractive influence of its magnetic poles, which are situated a short distance from the geographical poles, are supposed to give the direction of the magnetic needle. Captain Edward Parry, while engaged in his voyage of Arctic discovery, came upon a certain spot in the northwestern extremity of Baffin's Bay, about 20 degrees, or 1,200 nautical miles, from the true north pole, where the magnetic needle which had been varying to an extreme degree for some time, swung absolutely half around the compass and pointed due south. It continued to point thus as he sailed north, or on to the north, and therefore the spot where the change was made was denominated the north magnetic pole. The magnetic poles are never stationary, but are ever varying to the east or west, and back again in long periods of time. There are two lines on the earth's surface passing irregularly from north to south,

one through America and the other across the eastern continent, where there is no variation of the needle. East or west of those lines the variations are sometimes considerable. It is also subject to daily and yearly variations, and in order to become a good navigator these must be understood, and that is the point we are now arriving at.

Christopher Columbus now appeared upon the scene, with a mine of geographical knowledge. He had studied much, and he had a theory of his own. He believed the world to be round; and that a passage could be made to India by way of the western or Atlantic ocean. His opinions were received with jeers and laughter. He had no money, and was without the confidence of the people. He applied to Ferdinand and Isabella, the king and queen of Spain, for aid, and a fleet of three small vessels were fitted out and placed at his disposal. On the 3d of August, 1492, he left the Spanish port, and with the floating compass* for his only guide set sail for the voyage across the wide Atlantic. It was a bold undertaking, and many deeming him fool or madman declared they had seen the last of him or his crew. Day after day the sun arose and set in its ceaseless round, and revealed nothing but the trackless deep. His crew became discouraged and sick of the enterprise, and wished to return. It was now observed for the first time that the magnetic needle did not point to the north. They were unacquainted with the laws of variation, and the men looked upon the compass with alarm. They would go back—they were ready for mutiny, and planned to rid themselves of Columbus when he refused to give up the project and retrace their course, and were for throwing him overboard under cover of darkness. Columbus could not give up the enterprise. He pretended to explain this new phenomena to his men, though the real cause he himself did not understand. He reasoned and expostulated with his rebellious crew, and continued on his course a few days longer, and on the morning of the 12th of October he landed at San Salvador. He believed he had reached India, and he gave the inhabitants the name of Indians. He returned to Europe and received the welcome plaudits of the world. His opinions, which had been denounced as foolish and visionary, were demonstrated to mankind as established facts,

*When and by whom the compass card was added are still matters of conjecture; but the 32 points, or rhumbs, into which it is divided were recognized at least as early as 1391. The Dutch claim the distinction of having added the card.

and civilization was to advance with rapid strides. Such were the great triumphs of the mariner's compass; and had it not been for that simple instrument America might at this hour have been a howling wilderness, and the true shape of the world unknown.

Since Columbus' time improvements of every description have been made to the mariner's compass and the magnetic needle of today is so delicately constructed and so perfectly poised that fractions of a degree of a circle can be measured with accuracy where half points could hardly be reckoned by the old-time card compass.

From the floating compass the magnetic needle was balanced upon a steel pivot, in a circular box containing a card, upon which the different points of the compass were marked. This kind of compass is called the "dry card" because it has no flotation power—a liquid to prevent the card from flying round in a seaway. Even this kind of compass was a rude instrument compared with the compass of the present time.

As a rule these compasses worked slow and were sluggish, owing to the great amount of friction on the bearing point, caused by the heavy weight of the magnet and other appendages of the card. This friction on the bearing point was both injurious in respect to steadiness and detrimental in blunting it or boring into the cap, and for this reason such a compass soon became defective.

Who has not seen a piece of marlin or spun yarn made fast to the bowl of a dry compass, and occasionally twitched by the man at the wheel to "keep the card alive," or, as it is termed in Jack's phraseology, "to keep the compass afloat."

There are quite a number of card compasses, of old style, in existence and doing service today. They will be found in some of the old-time schooners of the lake "mosquito fleet." It may be said that they are of little use, and but little reliance can be placed on them.

It must not be supposed from this that the dry card compass is obsolete and out of date; the kind just mentioned is, but the finest compass made in the world today is the dry kind, invented by Sir William Thompson, now Lord Kelvin.

In constructing this compass Lord Kelvin came to the conclusion that no weight was in any case to be added beyond that which was necessary for supporting the card; and that to accomplish this a plurality of short needles were to be used, whereby greater surface is secured than would

be the case were the same amount of material used in a lesser number of needles of the same length.

Manufacturers of compasses at that time were of the opinion that in order to gain steadiness in a seaway it was obtained by heaviness of needles and compass card. This is not true; thus if the addition of weight to the compass card improves it in respect to steadiness in a seaway, it is not because of the additional friction on the bearing point that this improvement is obtained; on the contrary, the dullness of the bearing point, or too much weight upon it, renders the compass less steady at sea, and at the same time, less decided in showing changes of the ship's head than it would be were the point perfectly fine and the friction reduced to the minimum. It is by increasing the vibrational* period that the addition of weight gives steadiness to the compass. If weight were to be added to produce steadiness the place to add it would be at the very circumference of the card, by which means it would require a large amount of inertia, depending upon the extended radius of gyration†. All of these points have been embodied in the Lord Kelvin compass.

A magnetic chart shows two lines, called "lines of no variation," which extend from the magnetic poles. At all places on these lines the magnetic and true meridians coincide, and, as a consequence, all compasses on these two lines will point true north (defined by Ursae Minoris—Pole Star) provided deviation does not exist in the compass.

One of these lines passes from the north magnetic pole through our capitol at Washington, through Charleston, S. C., the Windward West India Islands, the eastern part of Brazil, and continues on through the South Atlantic Ocean. Looking towards the north, westerly variation exists on the right-hand or easterly side of this "line of no variation," and easterly variation exists on the left or westerly side.

The other line of no variation passes through northern Europe, the middle of the Indian Ocean, the western part of Australia, and continues on south of that continent.

The North Star (Polaris) may be accepted for all practical compass purposes as the true north, for its great-

est divergence is only $1\frac{1}{4}^\circ$ from the geographical pole, or about the eleventh part of one point of the compass. Twice in every 24 hours the North Star bears true north, then for 6 hours it recedes or moves sideways, until it bears $N\ 1\frac{1}{4}^\circ\ E$, or $N\ 1\frac{1}{4}^\circ\ W$. It then approaches the pole for 6 hours at the end of which time it is on the meridian again, and bears true north.

Of course, it is the earth's motion that gives an apparent movement to the star, as the latter is fixed. It is this revolution of the earth that seems to give an orbit to the Pole Star, the radius of which orbit is about $1\frac{1}{4}^\circ$ from the pole. When the Pole Star is between (intercepts) the observer and the north pole, or when the north pole is between the observer and the Pole Star, then in both cases, the star is on the meridian of the observer and bears positively true north. As has been explained, however, the North Star varies so little at all times from the true north that it may always be accepted as indicating the geographical pole of the heavens.

Now let us appreciate an interesting fact, which may at first serve to puzzle some of the readers of this article.

The compass is never expected to point true north, or to the North Star, unless the ship is on the line of no variation, otherwise the compass is out owing to deviation.

The north of the compass card should point as many degrees to the westward or to the eastward of the North Star as the chart diagram compass calls for, which latter expresses the variation existing for the latitude and longitude of the ship.

It is now necessary to carry the reader back nearly five thousand years to the time that the great warrior Hoang-ti ruled the Chinese empire. It was in the first year of the reign of that emperor, which, according to history was 2698 B. C., or almost three thousand years before the mission of our Saviour, that certain celestials discovered that if a narrow splinter of the loadstone, or natural magnetic iron ore, found in Asia Minor, was placed upon a piece of wood and the latter allowed to float in a bowl containing water that the iron would invariably point in a north and south line. They also devised a circular wooden card on which twenty-four rays were drawn, and to each one of these lines was given a name, and the whole called *ting-nan-ching*, which is the Chinese word for "compass." The south point of the circle was dignified with a distinguished mark, in the same way that the Christian nations today define the north point of their compass by a fleur-de-lis or arrow. To

*The vibrational period, or the period of time, of a compass, is the time it takes to perform a complete vibration (to move or swing to and fro) when deflected horizontally through any angle not exceeding 30° or 40° and left to itself to vibrate slowly. This is more fully explained in Magnetism.

†Gyration, the act of turning or whirling, as around a fixed center. The radius of gyration is the distance between the axis of a rotating body and its center of gyration.

show how little change has been effected by the Chinese in the manufacture of this instrument, it is only necessary to state that their native made compass of the present time shows only the twenty-four points given to it five thousand years ago.

The earliest reference that Chinese history makes to the practical employment of the compass deals with the year 2634 B. C., at which time the Emperor Ho-ang-ti had reigned sixty-four years. After a great battle with the forces of the Emperor Tchi-yeou, the latter having been beaten retreated towards the south, but was followed by Ho-ang-ti until a dense fog bewildered the pursuers and hid the escaping armies from them on the great plain of Tchou-lou. Ho-ang-ti then had a compass set up in a chariot, and the army following this vehicle as it moved towards the south point indicated by the dragon's head, the legions of Tchi-yeou were overtaken and made prisoners.

It was not until about the year 300 A. D., that the Chinese first employed the compass for the purposes of navigation, and Japanese historians claim that while their neighbors invented the compass, the Japs showed them how to make use of it to reach lands beyond the horizon.

Although, as it has been explained, the compass was invented nearly 5,000 years ago, it was not known to European nations until the year 1,300 A. D., and even 200 years later, at the time that Columbus set sail to discover a new world the introduction of this instrument had progressed so slowly that many vessels were not provided with it, but shaped their course in the day time according to the trend of the land, and in the night depended upon the bearing of the North Star. How the old navigators managed in fog and cloudy weather, history does not record. The variation of the compass was discovered on board the Santa Maria while that vessel was on her first western voyage as the flagship of Columbus.

From that time on the deflections of the needle from the pole have been regularly observed in various countries, and so carefully have they been recorded that they form today a most valuable guide to trace back the vagaries of the magnetic needle and to base calculations upon for the future.

It has been determined substantially that the magnetic poles of the earth toward which all compass needles point, and which are somewhat widely separated from the geographical poles, are not permanent, but that they shift slowly from west to east and back again after long periods of time. Thus



JAVELIN IN THE BRITISH MOTOR BOAT RACES.

For description see Marine Review, July 12.

it is that the variation of the compass is a slowly changing one and that for the same places a great contrast exists between the records of the time of Columbus and those of today. In Paris, in the year 1660, the needle pointed true north. The next year observations showed that it had assumed a westerly inclination. During the following hundred years the westerly variation increased to 20° , and the needle continued to deflect westerly from the North Star until the year 1815. Just after the battle of Waterloo, observations showed that it had ceased its westward movement and commenced to recede toward the east. This retrogression of the compass needle has been constantly going on in France since that time.

It was Sir John Ross who discovered the north magnetic pole on June 1, 1831, which was then in Lat. $70^\circ 5' N$, Long. $96^\circ 47' W$. In his first voyage to the arctic regions Edward Parry was second in command, and for this reason sometimes Parry is given the credit of locating the magnetic pole. The pole was discovered by means of both the compass needle (horizontal needle) and the dipping needle (vertical needle). Sir John Ross discovered the south magnetic pole in 1839. Sir John was an uncle of Sir James, and the latter was with his uncle when the north magnetic pole was discovered. Sir James was an eminent English Arctic navigator, born in London in 1800. He served his uncle, Sir John Ross, as midshipman in his first voyage in search of a northwestern passage, which was in 1818. Between 1819 and 1825 he made three voyages under Capt. Edward Parry. He took a prominent part in Sir John Ross's

second voyage, 1829 to 1833. In 1839 he was appointed commander of an expedition sent with two vessels, the Erebus and Terror, to explore the antarctic regions with special reference to the science of magnetism. He reached the 78th degree of south latitude, and discovered an ice bound continent, to which he gave the name Victoria Land, and the coast of which his party traced for 700 miles. The south magnetic pole was not quite reached owing to impenetrable barriers of ice, but so very nearly that its position was without difficulty ascertained by calculation.

A WATCH A COMPASS.

A very simple way to determine approximate compass directions by the aid of a watch, is as follows: point the hour hand at the sun, and the south point of the heavens will lie exactly midway between the hour hand and the numeral XII on the dial. If for instance, the hour hand rests on the two o'clock mark, then the south point will be indicated by the numeral I; if the hour be four o'clock, the south point will be represented by the numeral II; if the hour is eight o'clock the south point will be found at the numeral X; if the hour is twelve o'clock, the south will be shown at the numeral XII. Just try this and prove it.

The tug Wm. B. Castle was sunk in collision with the steamer Robert Holland above Belle Isle this week. The crew of the tug were rescued by the Holland.

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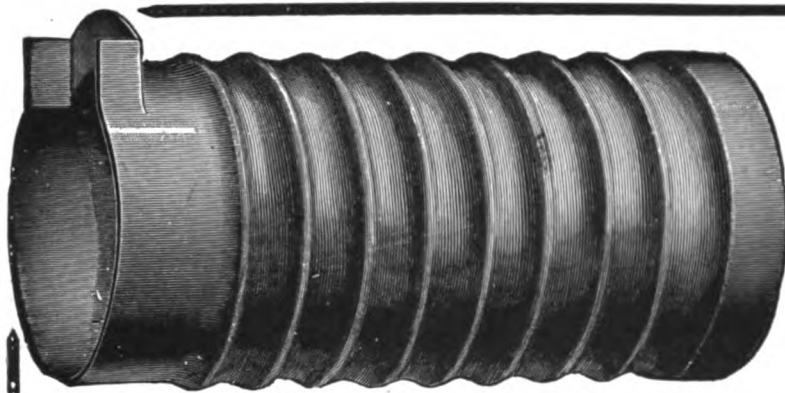
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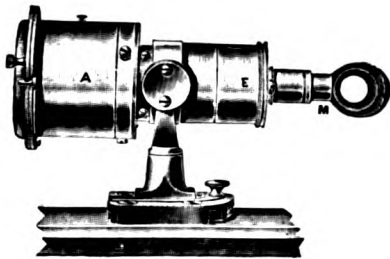
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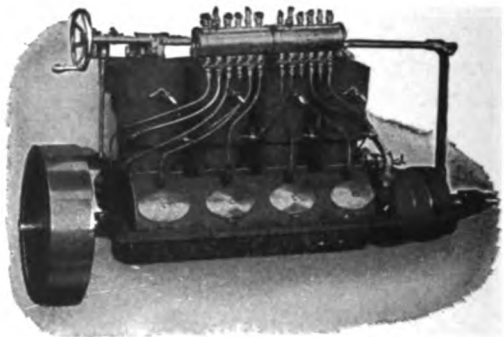
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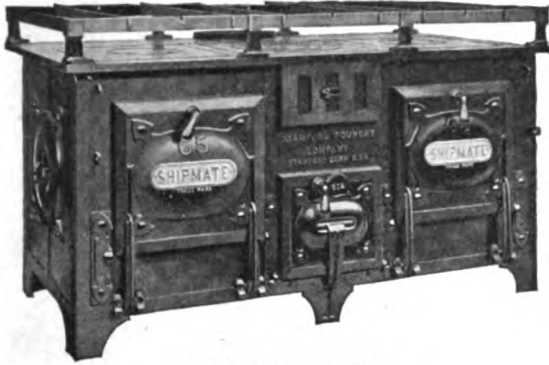
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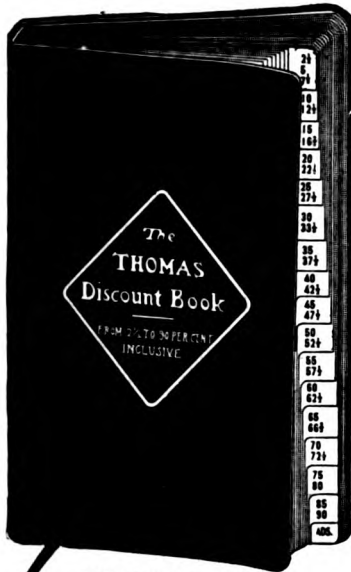
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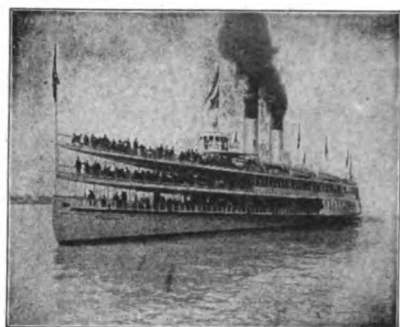
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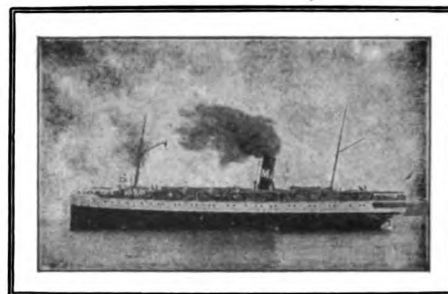
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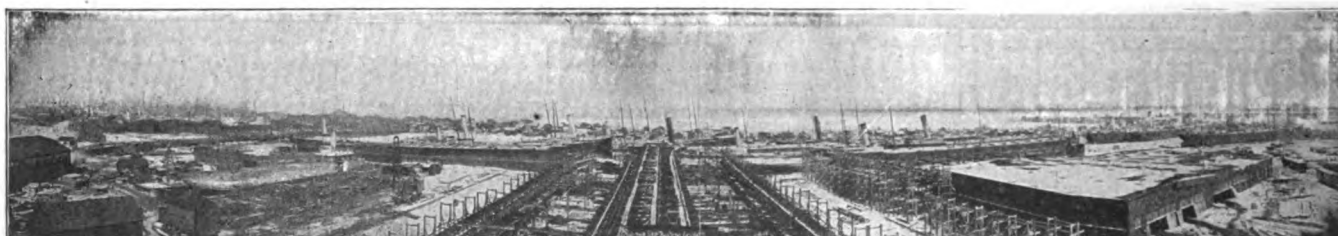


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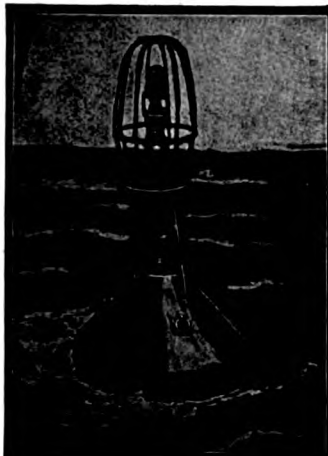
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Large stock of material always
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Repairing promptly attended
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FROM 80 TO 365 DAYS AND NIGHTS WITHOUT ATTENTION AND CAN BE SEEN AT A DISTANCE OF SIX MILES.

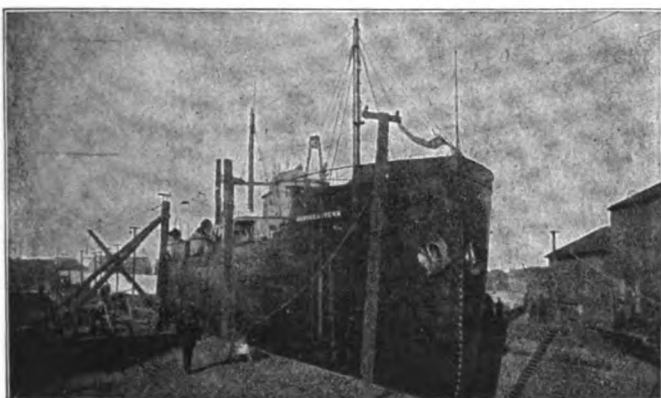
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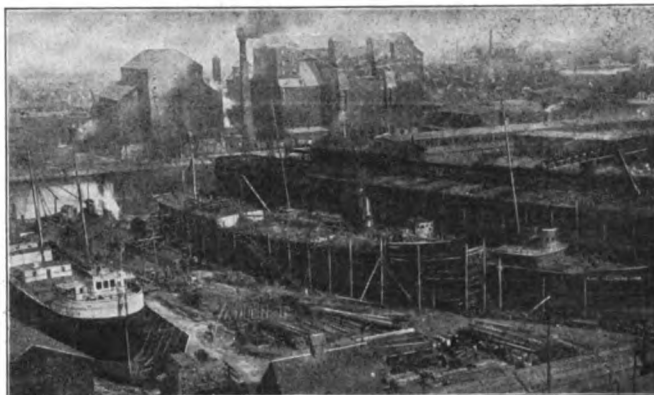
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We have two ship yards offering every facility for the repair of both steel and wooden vessels. South Yard Dock is 450 ft. long on keel blocks; 460 ft. over all; 60 ft. width of gate and 16 ft. over sill. West Yard Dock is 312 ft. on keel blocks; 45 ft. width of gate and 12 ft. over sill. Rudder pit in each dock.

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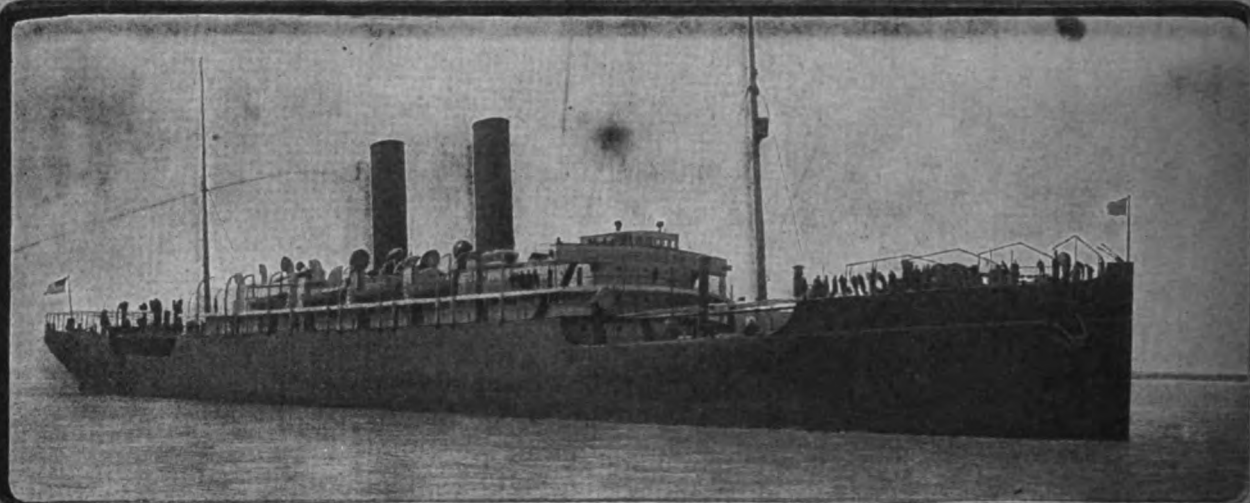
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CONSTRUCTION AND REPAIRING
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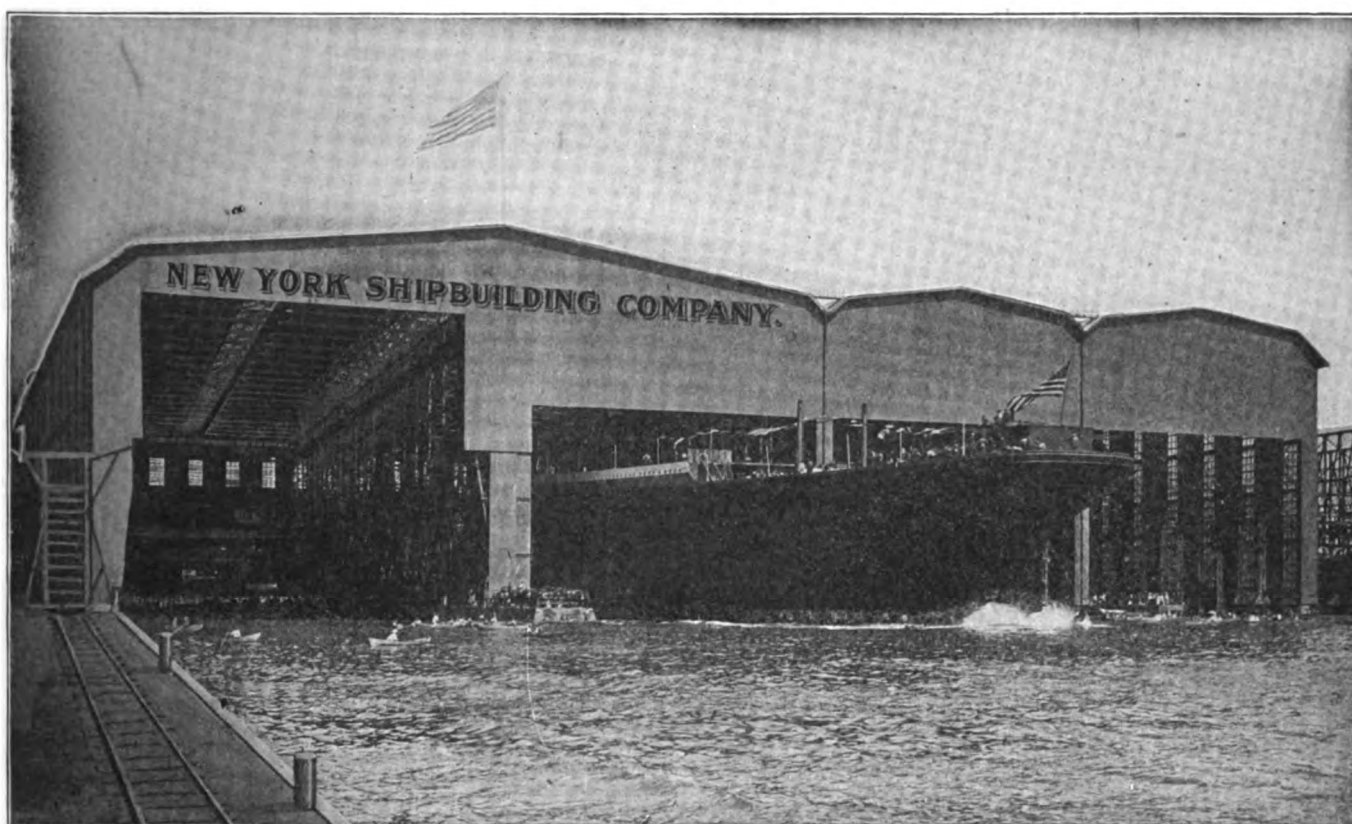
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Best Facilities for Repair Work

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Repairs done under shelter.

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DEARBORN FEED-WATER TREATMENT

Made to suit the water as per analysis, used regularly, keeps boilers free from scale and prevents any corrosive action the boiler water may have on the iron.

Economy of operation is possible only with clean boilers.

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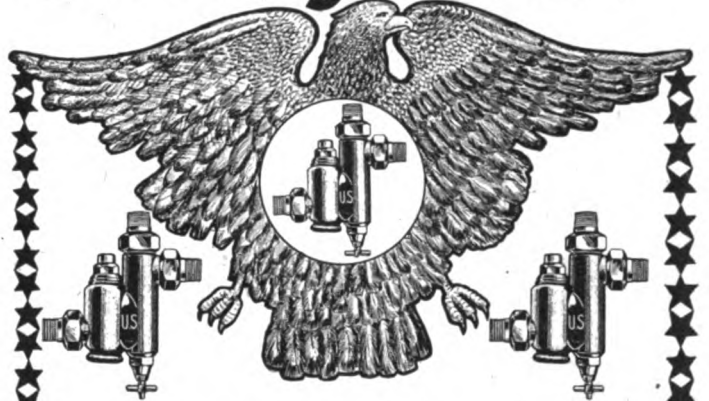
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10 1/2 X 15 INCHES.

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Clearly showing every port on the Great Lakes from Clayton to Duluth. It is small enough to fold up and carry in the coat pocket or pigeon hole of a desk, and is also very suitable for framing.

With this little chart near at hand, you save the trouble of stepping to a chart case and taking out a great big three-foot square chart that is awkward to handle.

The Most Accurate Small Chart Ever Published.

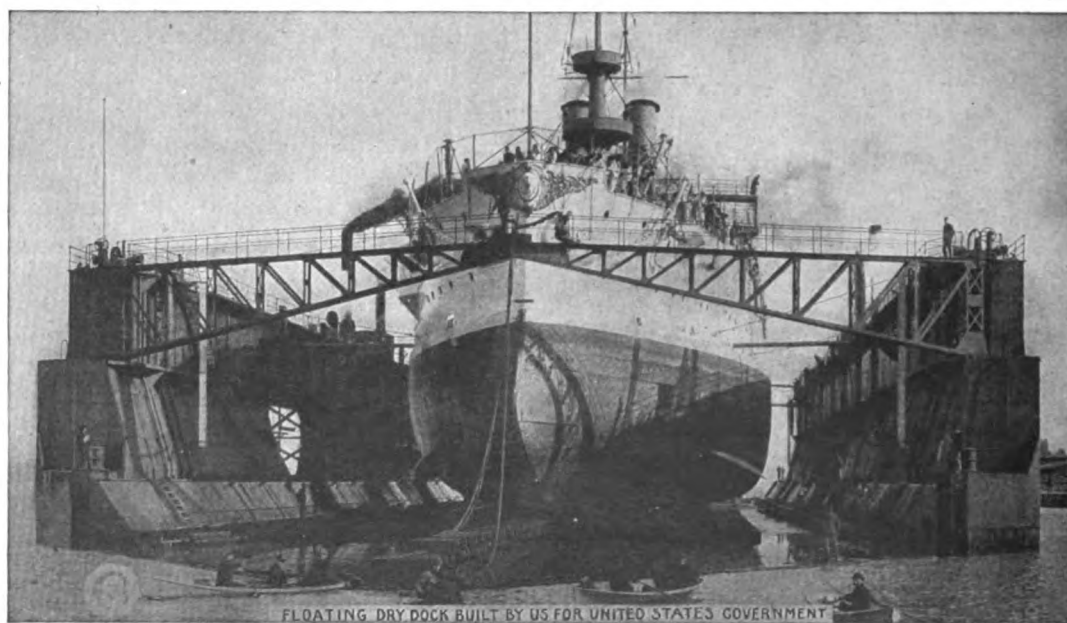
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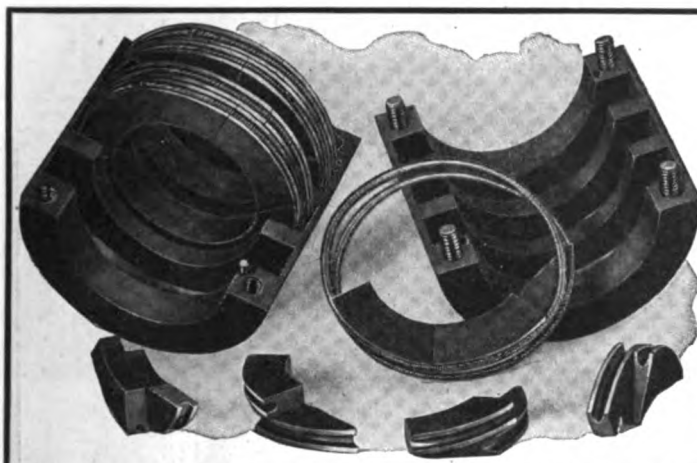
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CAPABLE OF DOCKING
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PATENTED IN U. S. AND FOREIGN COUNTRIES.

This packing is giving perfect satisfaction on all styles of rods on marine and stationary engines, locomotives and air compressors, and works perfectly on all sizes of rods from the highest to the lowest pressure. A glance at the above cut will show that the packing is arranged so that it adjusts itself to the rod and gives the rod a high polish and reduces the friction to a minimum.

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For Hard Service

"Raino" is a guaranteed absolutely waterproof cloth.

For ships' officers, yachtsmen, seamen, etc., it is the ideal waterproof garment.

"Raino" is very light, clean and neat looking. Far superior to either oilskins or rubber. It will not rot, nor is it stiff, heavy, oily or foul smelling.

After two years of the hardest kind of army and naval service tests in all parts of the world hundreds of officers declare it the most durable waterproof garment made.

"Raino" officer's Long Coat...\$6.00
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A week's trial, Rain, Hose or Shower. If not satisfactory express back at our expense. Money returned. Show our faith.



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Made in Large Variety.

Will not shake to pieces when placed on jarring machinery. Will feed oil at the same rate until cup is empty.

If your local dealer cannot furnish them, notify us.

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LARGEST MANUFACTURERS OF HIGH-GRADE ENGINEERING SPECIALTIES IN THE WORLD.

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STEEL CASTINGS FROM 100 TO 100,000 LBS.

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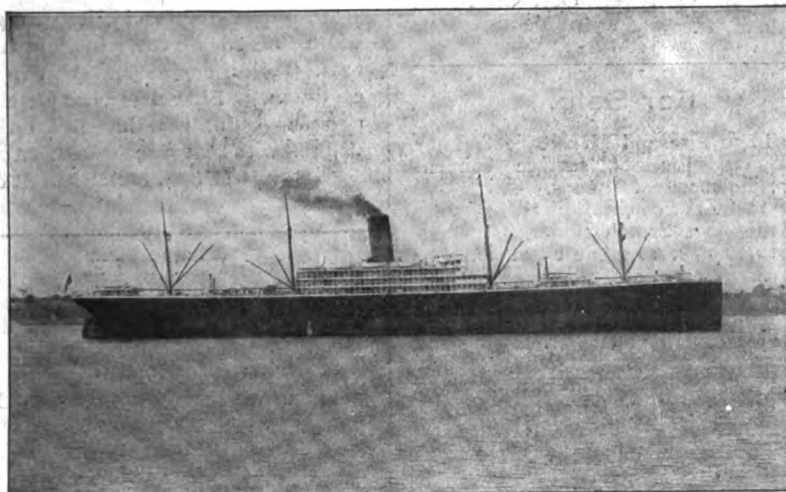


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550 Feet Long, 56 Feet Beam.

Designed and built by us and equipped with patented hawse pipes which permits the anchors being stowed very snugly, bringing them practically flush with outside of the hull. Expensive and serious damage in case of collision is avoided by use of this improvement.

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Steamship Minnesota equipped with Hyde Windlass and Capstans.

Selected for the Minnesota and Dakota of the Great Northern Steamship Co.'s fleet—the largest vessels ever built in the United States. They are also being installed on nearly all of the vessels now building for the Navy Department, Revenue Cutter service, Lighthouse Board and the United States Coast Survey.

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CLEVELAND, O.

WANTED and FOR SALE Department.

PROPOSALS.

U. S. Engineer Office, Milwaukee, Wis., June 28, 1906. Sealed proposals for removing old piers and building pile piers, Manitowoc Harbor, Wis., will be received here until 3 P. M. standard time, July 30, 1906, and then publicly opened. Information furnished on application. W. V. Judson, Major, Engrs.

DESIGNS FOR BATTLESHIPS. The Navy Department invites the attention of competent naval constructors in the United States to the opportunity afforded by the Act of Congress (Public No. 336) to submit plans and specifications for a battleship. Preliminary plans will be received under seal on November 1, 1906, which preliminary plans, with the attendant specifications shall show the displacement, draught, and dimensions of the battleship proposed and the speed and estimated cost and likewise within what time completed plans and specifications for the construction of such vessel will be furnished, if desired by the Department, and finally, what amount will be deemed by the said constructor just and equitable compensation for the said preliminary and the said completed plans, should the same or either of the same be paid for by the Department in accordance with the terms of the statute aforesaid. A copy of the Departmental circular on the subject will be sent on request addressed to the Navy Department, Washington, D. C. Charles J. Bonaparte, Secretary of the Navy.

Proposals for dredges.—U. S. Engineer Office, Custom House, St. Louis, Mo., July 18, 1906. Sealed proposals, in triplicate, for construction and delivery of two self-propelling hydraulic dredges and their pontoon pipe lines will be received here until 12 noon, standard time, August 20, 1906, and then publicly opened. Information furnished on application. Thomas L. Casey, Major, Engrs.

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Thames-built cruiser racer now at her best. Winner ten prizes out of twelve starts. £400. Cost £600. Particulars of Alfred Fentiman, 42 Bishopsgate Without, London, E. C.

For Sale.

Five Scotch Boilers, allowed 160 lbs, steam. Good as new. ERIE MACHINERY CO., 729 Garfield Bldg., Cleveland, O.

For Sale.

1,000 h. p. fore and aft Neafie & Levy compound Engine; surface condenser; independent pumps.
Two 12-foot Scotch Boilers.
One 13½-foot Scotch Boiler.
One 10 16-25 x 16 triple expansion Engine.
Three 150-h. p. Almy Boilers.
One 200-h. p. Tregurtha Boiler.
One 14 30 x 24 fore and aft Engine and condenser.
One Williamson steering Engine.
One 10 k. w. electric lighting Set.
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One Providence Windlass, 50 fathoms 1½ in. chain.
Two thrust Shafts and Bearings, 8½ in. diameter.

MARVIN BRIGGS,

17 Battery place, New York, N. Y.

Steamer T. S. Christie.

Length 160 ft.; beam 30 ft.; carrying capacity, lumber 525,000 ft., coal 800 tons. Rating in Inland Lloyds Register, A1½*, valuation \$22,000. For price and particulars address Capt. P. Larsen, Box 249, Chicago, Ill.

FOR SALE.

A Bargain.

Steamer E. F. Gould, length 137 ft., width 28 ft., depth 8 ft. 5 in., tonnage 261 tons. Boiler, engine and hull in good condition. First-class, complete sand pumping outfit now installed on boat, will sell with boat if so desired. Apply
JOHN M. MCKERCHEY,
Detroit, Mich.

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Three yard clam shell dredge in fine order rigged to work as dipper machine.

Machinery for one other dredge.
14 x 16 tug. Lying at River Rouge, Mich.

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Commodious Steam Yacht, 75 ft. long, 18 ft. beam, 6½ depth of hold. Two staterooms and finest outfit, including electric light plant, search light, and power launch. Triple expansion engine, safety boiler. Cheap and easy steamer. Inquire of R. J. Cram, Port Huron, Mich.

WANTED.—Scow to carry 500 to 700 tons on deck. Address Patrick Koehane, Lorain, Ohio.

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FOR THE
CLASSIFICATION OF STEEL AND WOODEN VESSELS.



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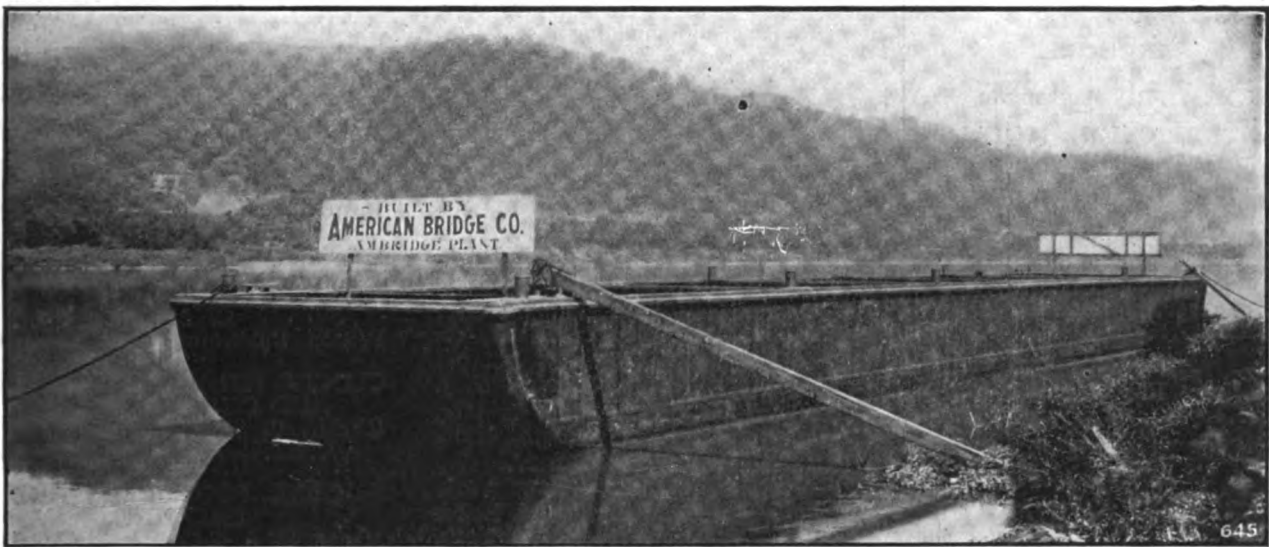
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We place insurances in the most advantageous markets, employing, in the interest of our clients and with equal facility, all Foreign and Home companies, at the best procurable rates and terms.

We Represent Only the Assured.

FOR SALE



We have on hand at Ambridge, Pa., for immediate delivery, one steel barge of which the following is a general description :

Length over all	-	173' 0"
Breadth (Moulded)	-	26' 0"
Depth	-	10' 0"

The barge is of the open hold type with a twelve-in. (12") deck side stringer forming a gangway at each side. The bilge or knuckle of this barge is rounded off to a radius of 12", this construction being carried up rake to deck. The ends in elevation are rounded off forming rake of about 10' 0" radius. At each end at foot of rake, a steel, watertight collision bulkhead is fitted, forming with the rake framing a substantial construction for towing purposes. Heavy cross beams are fitted about 30' 0" apart and at tow posts. The ordinary transverse framing is spaced about 2' 0" apart and deep floors and web frames are arranged about 15' 0" apart and at tow posts.

At the ends, a working deck is fitted and an ample number of towing posts are provided for the proper handling of the barge. A rubbing strake is fitted on the side and ends of this barge and two pump casings or boxes are provided. This barge is well adapted for carrying bulk cargoes such as coal, etc., but it should be noted that there is no wood ceiling laid on floors. The carrying capacity in short tons on a fresh water basis is as follows :

At 8' 0" draft	-	970 tons.
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For price and further particulars apply to the

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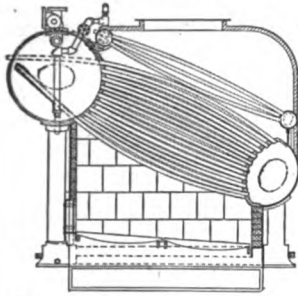
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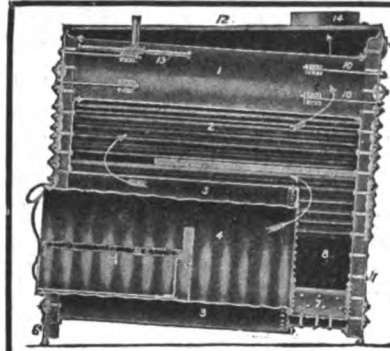
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Internally Fired.

Scotch and Water Tube types combined, eliminating all objections.

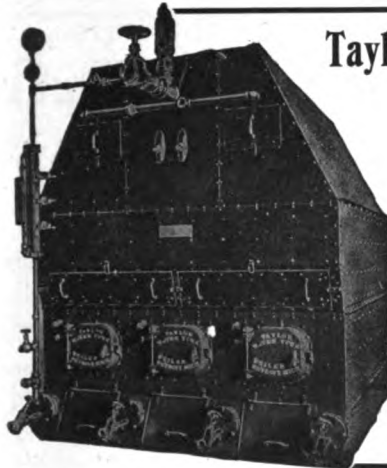
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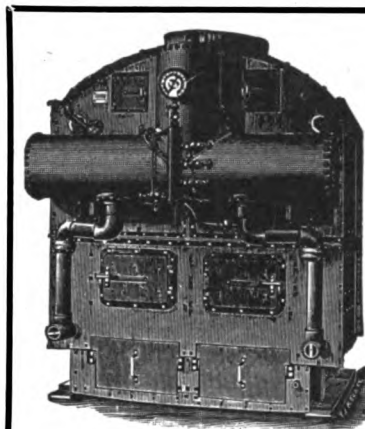
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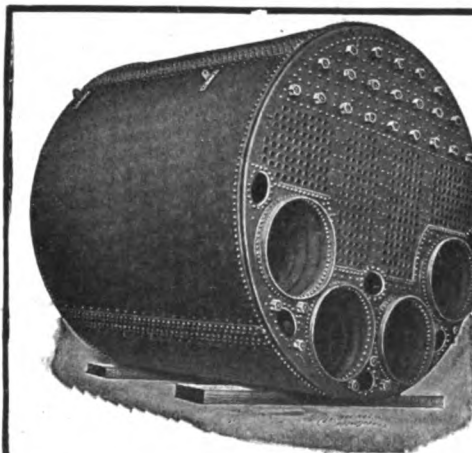
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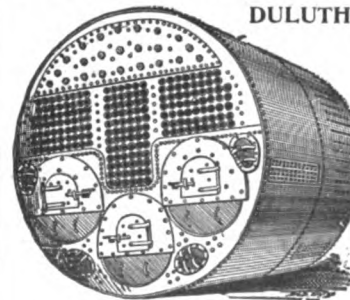
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Armstrong Cork Co., Pittsburg, Pa.
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Hubbell Co., H. W., Saginaw, Mich.
Smith Co., L. P. & J. A., Cleveland.
Starke Dredge & Dock Co., C. H.,
Milwaukee.

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Chicago Ship Building Co.,
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Cramp, Wm. & Sons, Philadelphia.
Detroit Ship Building Co.,
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Chase Machine Co., Cleveland.
Cramp, Wm. & Sons, Philadelphia.

Detroit Ship Building Co., Detroit.
Fletcher, W. & A. Co., Hoboken, N. J.
Fore River Shipbuilding Co.,
Quincy, Mass.

ENGINE BUILDERS—Continued.

Great Lakes Engineering Works,
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Hall Bros., Philadelphia.

Lockwood Mfg. Co.,
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Maryland Steel Co.,
Sparrows Point, Md.

Milwaukee Dry Dock Co., Milwaukee.
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New York Ship Building Co.,
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Sheriffs Mfg. Co., Milwaukee.

Superior Ship Building Co.,
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Trenton, N. J.

Toledo Ship Building Co., Toledo.
Trout, H. G., Buffalo.

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Northwestern Steam Boiler & Mfg.
Co., Duluth, Minn.

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Hunt, Robt. W. & Co., Chicago.
Kidd, Joseph, Duluth, Minn.

Mosher, Chas. D., New York.
Nacey, James, Cleveland.
Roelker, H. B., New York.

Wood, W. J., Chicago.

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Pickands, Mather & Co., Cleveland.

Pittsburg Coal Co., Cleveland.
Smith, Stanley B. & Co., Detroit.

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GAS BUOYS.

Safety Car Heating & Lighting Co.,
New York.

GAS AND GASOLINE ENGINES.

Chase Machine Co., Cleveland.

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Lunkenheimer Co., Cincinnati.

GAUGES, WATER.

Lunkenheimer Co., Cincinnati, O.

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General Electric Co.,
Schenectady, N. Y.

GRAPHITE.

Dixon Crucible Co., Joseph,
Jersey City, N. J.

HAMMERS, STEAM.

Chase Machine Co., Cleveland.

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Brown Hoisting Machinery Co.,
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Chase Machine Co., Cleveland.
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General Electric Co., New York.
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Marine Iron Co., Bay City.

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Falls Hollow Staybolt Co.,
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Detroit.

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New York.

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Detroit.

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Jenkins Bros., New York.
Lunkenheimer Co., Cincinnati.

Penberthy Injector Co.,
Detroit, Mich.

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Gilchrist & Co., C. P., Cleveland.
Hawgood & Co., W. A., Cleveland.

Helm & Co., D. T., Duluth.
Hutchinson & Co., Cleveland.
McCarthy, T. R., Montreal.

McCurdy, Geo. L., Chicago.
Mitchell & Co., Cleveland.
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Pickands, Mather & Co., Cleveland.

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Armstrong Cork Co.....Pittsburg.
Carley Life Float Co.....
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.....Wilmington, Del.
Kahnweiler's Sons, D.....New York.

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Russell & Watson.....Buffalo.

LOGS.

Nicholson Ship Log Co., Cleveland.
Walker & Sons, Thomas.....
.....Birmingham, Eng.

LUBRICATING GRAPHITE.

Dixon Crucible Co., Joseph.....
.....Jersey City, N. J.

LUBRICATORS.

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LUMBER.

Martin-Barriss Co. Cleveland.

MACHINISTS.

Chase Machine Co.....Cleveland.
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Lockwood Mfg. Co.....
.....East Boston, Mass.

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.....Detroit.

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.....Oberlin, O.

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.....Schenectady, N. Y.

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.....Brookline, Mass.

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Wood, W. J.....Chicago

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.....Jersey City, N. J.

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Baker, Howard H. & Co....Buffalo.
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Hubbell Co., H. W....Saginaw, Mich.
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Sullivan, M.....Detroit.

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Great Lakes Engineering Works....
.....Detroit.
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Lockwood Mfg. Co.....
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Milwaukee Dry Dock Co.....
.....Milwaukee.
Newport News Ship Building Co..
.....Newport News, Va.
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Sheriffs Mfg. Co.....Milwaukee.
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Toledo Ship Building Co.....Toledo.
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REGISTER FOR CLASSIFICATION OF VESSELS.

Great Lakes Register.....Cleveland.

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Bourne-Fuller Co.....Cleveland, O.

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.....Cleveland, O.

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Lunkenheimer Co.....Cincinnati.

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Baker, Howard H. & Co....Buffalo.
Upson-Walton Co.....Cleveland.

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See Wrecking Companies.

SEARCH LIGHTS.

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See Punches, and Shears.

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Cramp, Wm. & Sons..Philadelphia.
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Detroit Ship Building Co....Detroit.
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Great Lakes Engineering Works....
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Lockwood Mfg. Co.....
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Manitowoc Dry Dock Co.....
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Maryland Steel Co.....
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Milwaukee Dry Dock Co.....
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Newport News Ship Building Co..
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New York Shipbuilding Co.....
.....Camden, N. J.
Roach's Ship Yard....Chester, Pa.
Shipowner's Dry Dock Co..Chicago.
Toledo Ship Building Co.....Toledo.

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Marine Mfg. & Supply Co.....
.....New York.
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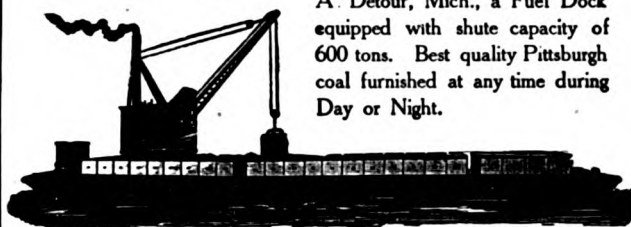
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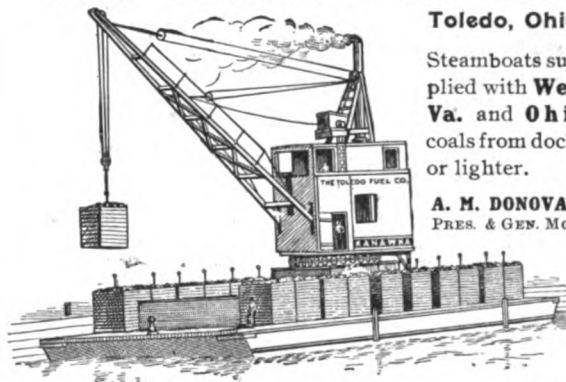
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Otis Steel Co..... Cleveland.

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Chase Machine Co..... Cleveland.

Dake Engine Co..... Grand Haven, Mich.

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Hyde Windlass Co..... Bath, Me.

Marine Mfg. & Supply Co..... New York.

Sheriffs Mfg. Co..... Wilwaukee.

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Nacey, James Cleveland.

Steel, Adam Cleveland.

Wood, W. J. Chicago.

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Lunkenheimer Co.... Cincinnati, O.

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..... Boston.**TUBING, SEAMLESS.**

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Lunkenheimer Co..... Cincinnati.

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Ashton Valve Co..... Boston.

Lunkenheimer Co..... Cincinnati.

Republic Belting & Supply Co.....
..... Cleveland, O.

Ross Valve Co..... Troy, N. Y.

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Hutchinson & Co..... Cleveland.

McCarthy, T. R. Montreal.

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Sullivan, D. & Co..... Chicago.

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Lunkenheimer Co..... Cincinnati.

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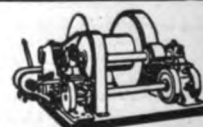
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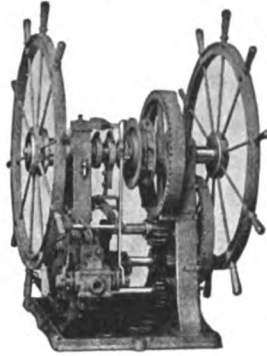
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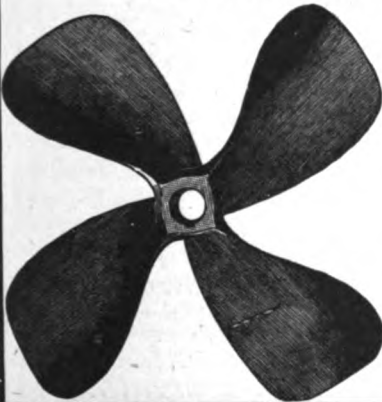
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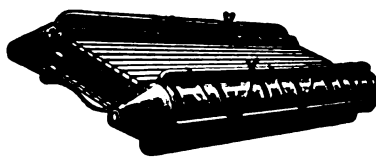
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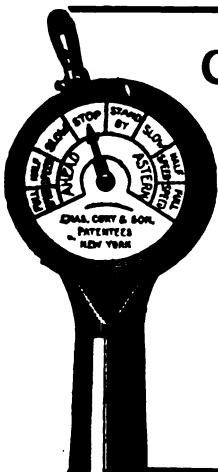
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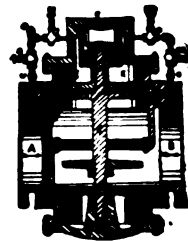
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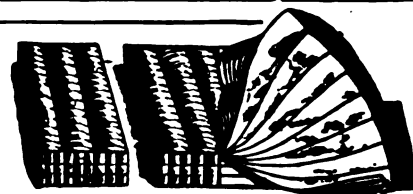
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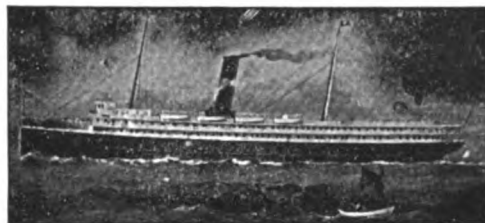
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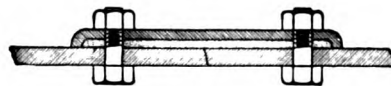
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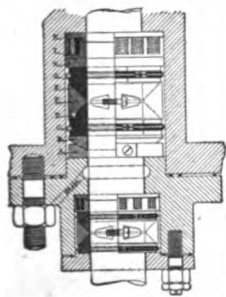
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